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ABSTRACT

The document, intended to convey some practical application of behavior principles to teachers and teacher educators involved with exceptional children, is a synthesis of the 12 presentations from the CEC Invisible College on the Application of Behavioral Principles in Exceptional Child Education (March 25-26, 1971). Although all were behaviorists, the majority of the participants belonged to the precision teaching school. Thus, most of the chapters focus on techniques and applications of precision teaching, including use of the standard behavior charts. Specific topics include the history and development of precision teaching, students' individualized curricula, the setting of aims (proficiency levels), behavior modification applied to speech therapy, implications of the behavioral approach for the education of the gifted, training parents to teach their deaf-blind children using behavior modification procedures, description of a laboratory school for problem children, precision teaching used with culturally different groups, parent-teacher cooperation, teacher training materials, and charting program maintenance in school systems for reinforcement and justification purposes. (KW)

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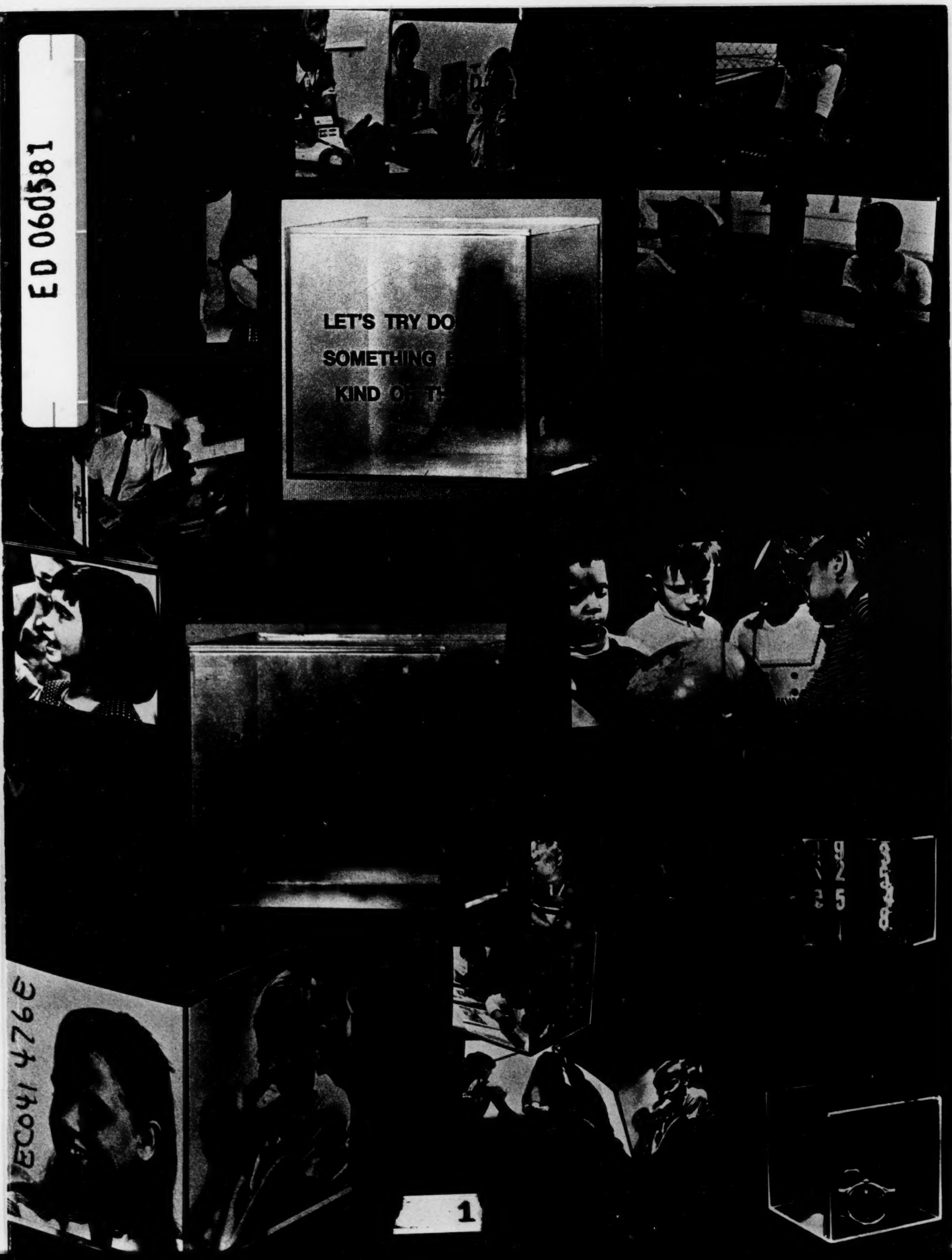
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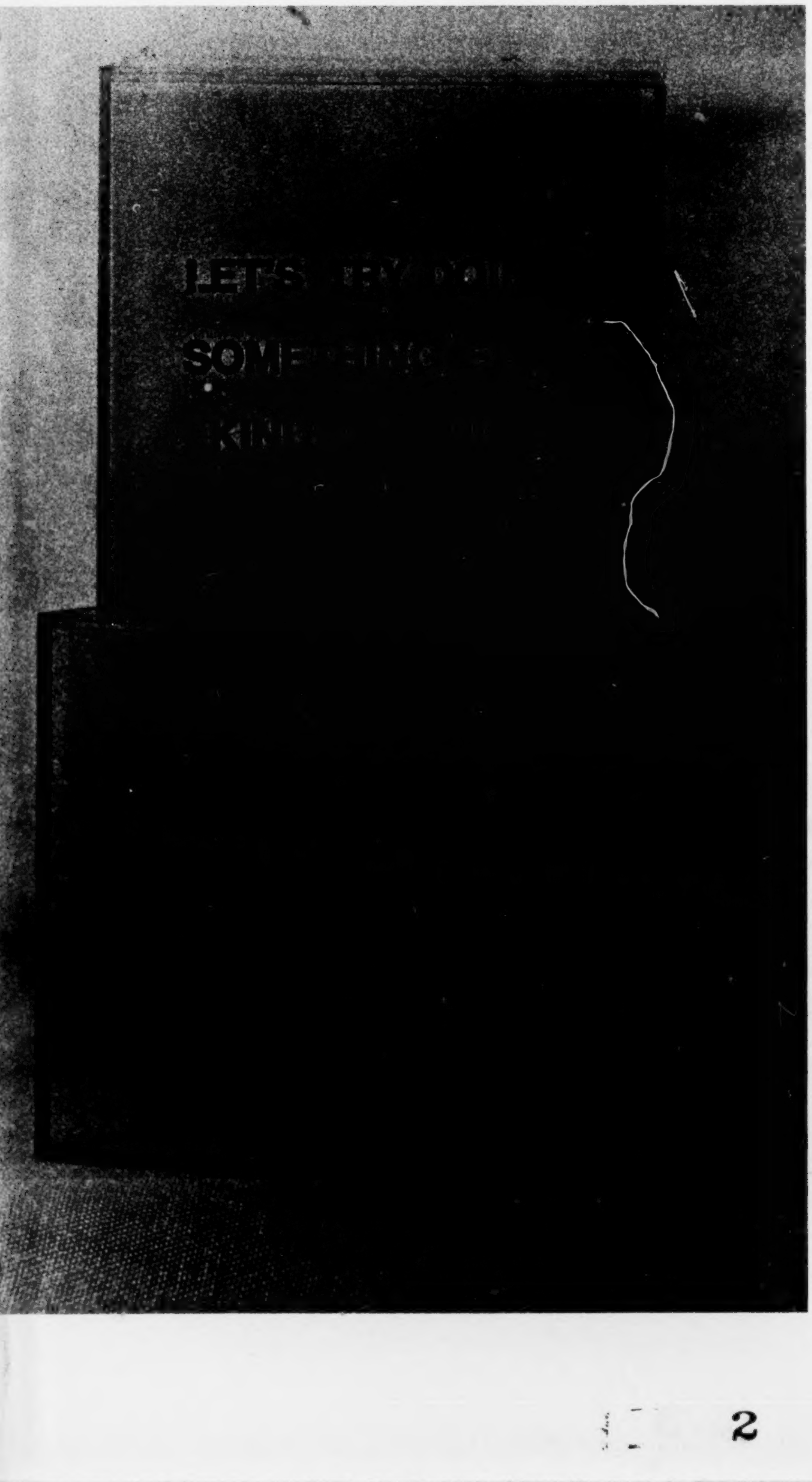

A report from the Invisible College Conference on the Application of Behavioral Principles in Exceptional Child Education, March, 1971

Conference Chairmen:

Sidney W. Bijou
Ogden R. Lindsley
Eric Haughton

Edited by:
June B. Jordan
Lynn S. Robbins
Published by The Council for Exceptional Children,
Arlington, Virginia

It is not so much a skill as a personal characteristic—an attitude. And that attitude is one of optimism. If you believe the principles of the behavioral approach, then an optimistic approach is the only one with which you can function. You believe that this child can learn and that you can arrange the environment to help him learn. You cannot induldge yourself in the luxury of saying, "He's too stupid," or "He must be brain damaged."

You naturally embrace an attitude of let's try doing something else kind of thing.

—*Sidney W. Bijou*

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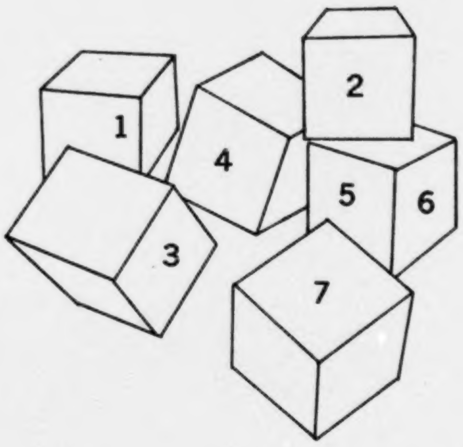
Authors

SIDNEY W. BIJOU's present positions include Professor of Psychology at the University of Illinois, Urbana-Champaign, member of the Institute for Research in Exceptional Children, and Director of the Child Behavior Laboratory. Currently on sabbatical, Dr. Bijou is working on Volume 3 of a series of books on the behavior analysis of child development which he coauthors with Dr. D. M. Baer. In addition to a book of readings, the series includes Volume 1 which explains the behavior analysis principles of development, Volume 2 which applies them to children from birth to age 2, and Volume 3 which will cover ages 2 to 5. The normal developing child is analyzed from the behavior analysis point of view, and then the principles are applied to special problems like special education. Dr. Bijou received his BS from the University of Florida, his MA from Columbia University, and his PhD from the University of Iowa. The University of Washington, where Dr. Bijou spent 17 years on the faculty, is credited by him with the initial work in applying behavior modification techniques to children.

THOMAS E. CALDWELL is Associate Professor of Special Education at Illinois State University. His preparation for teacher training includes experience as a classroom special education teacher. Dr. Caldwell received his bachelors degree from Illinois State University, his masters degree from George Peabody College for Teachers, and his doctorate from the University of Kansas.

ANN DELL DUNCAN received both her BS and MA degrees from the University of Minnesota and her PhD in special education from the University of Kansas. She taught at the Sheltering Arms Day School and Research Center for Mentally Retarded Children in Minneapolis, Minnesota. Presently, Dr. Duncan is Assistant Professor in the Department of Special Education, Ferkauf Graduate School of Humanities and Social Sciences, Yeshiva University, New York City.

CHARLES GALLOWAY is Director of Developmental and Educational Services for ENCOR where he emphasizes "the development of normalized experiences and living conditions for retarded people—and doing that as carefully and competantly as we can." He feels that behavioral knowledge and technology assist in



1. Ann Dell Duncan
2. Sidney W. Bijou
3. Eric Haughton
4. Thomas E. Caldwell
5. Harold Kunzelmann
6. David Phillips
7. Charles Galloway

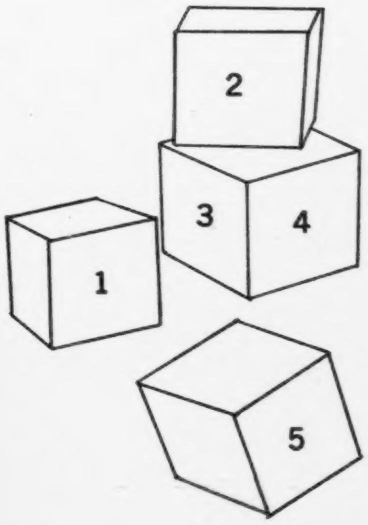
pursuing that goal. Dr. Galloway considers "a better shake for retarded kids professionally and skillfully accomplished" his major professional interest, and presently his efforts in this direction include getting totally immersed in and committed to a community program. Dr. Galloway received his bachelors degree from Florida State University, his masters from the University of Missouri, Kansas City, and his doctorate from the University of Kansas.

ERIC HAUGHTON is currently Evaluator for ComPARE, a pilot project involving the Clover Park, Olympia, and Federal Way School Districts in Washington State. This program concentrates on 6, 7, and 8 year old children with problems in reading acquisition. Precision teaching data on each child are stored in a computer, allowing a "within youngster check" of strengths and weaknesses so that teachers can then capitalize on the strengths while building up the areas in which the child needs help. At the time of his presentation, Dr. Haughton was Evaluation Specialist at the University of Oregon's Clinical Services Resource Center in Eugene and a Consultant to teachers and other school personnel using precision teaching and management techniques in Eugene School District 4J. His experiences in Eugene, he feels, were a major influence on his two main concerns: helping youngsters to become more involved in their own educational decision making and showing teachers and administrators how precise information allows teachers to become advisors rather than managers of their students. Dr. Haughton's bachelors degree is from the University of Western Ontario, his masters degree from the University of Toronto, and his doctorate from the University of Kansas.

NANCY JOHNSON, who received her undergraduate degree in psychology at Illinois Wesleyan University and her doctorate at the University of Kansas, feels, "If I am worthy of the title doctor, I ought to be able to bring what skills I have to bear on some of the problems of the inner city child—any child, but particularly the inner city child." This feeling led to the creation of Operation Upgrade of which Dr. Johnson is the Project Director. She says of this program, "I wanted to bring precision teaching to the community. It is a useful tool, and I wanted to get it around the best I could." Operation Upgrade successfully uses teenage tutors as precision teachers of inner city youngsters who are behind in reading.

Assistant Professor of Communicative Disorders at Utah State University, THOMAS S. JOHNSON's major professional interest is in the area of speech pathology. More specifically, Dr. Johnson is concerned with the application of behavioral management to the areas of speech and hearing and with performance based curriculum design for university training programs. Currently, his active research is in constructing behavioral programs in the area of voice. Dr. Johnson first got his interest in behavioral management from his experiences with Ogden Lindsley at the University of Kansas where he earned his PhD. He received both his bachelors and masters degrees from Utah State University.

Before assuming his present position as Supervisor of Mental Retardation and Specific Learning Disabilities Programs and Coordinator of Public Law 91-230, Parts D & G for the State of Washington, HAROLD KUNZELMANN had wide experience in the field of special education . He taught handicapped children, directed programs and private agencies, and spent five years as principal of the Experimental Education Unit at the University of Washington. Mr. Kunzelmann said of his background, "I made it a personal strategy to make sure that I've been through all of those phases so that as an administrator I would have had all of those experiences that are relevant to programing." He received his BA from Wichita State University and his MS from the University of Kansas. He has coauthored and edited a major book on the fundamentals of precision teaching.



1. Nancy Johnson
2. Ann Starlin
3. Thomas S. Johnson
4. Bonnie Jean Young
5. Ogden R. Lindsley

OGDEN R. LINDSLEY is Professor of Education at the University of Kansas. His academic background includes both bachelors and masters degrees from Brown University and a PhD in experimental psychology from Harvard University. Dr. Lindsley considers his primary professional accomplishments the coining of the term behavior therapy and establishment of the first human operant conditioning laboratory in 1953, receipt of the Annual Research Prize of the American Psychiatric Association in 1962, the creation of precision teaching in 1965, and in 1968, the establishment of the Behavior Bank, the first computer storage of human behavior frequencies and celerations.

DAVID PHILLIPS is Director of Child Development Program and Assistant Professor of Psychology at Wake Forest University. His academic background includes both bachelors and doctoral degrees from Arizona State University, Tempe, Arizona and a masters degree from California State College at Los

Angeles. Dr. Phillips feels that that what is significant in his work is "community work rather than research." He is primarily concerned with "training teachers and paraprofessionals in public school and day care settings in the use of behavior modification techniques and implementing these methods on a large scale, an entire public school system, for example." He is currently involved in implementing behavior modification procedures in community action projects.

At the time of her participation in the Invisible College, ANN STARLIN was using precision teaching techniques in her work on a teaching team with first, second, and third grade children in the Bemidji Public Schools, Bemidji, Minnesota. This year, in her association with the Bemidji Interdistrict Special Education Office, she works with the special education teachers in 15 rural school districts in Minnesota. Mrs. Starlin received her BA in elementary education and her MA in special education from the University of Oregon.

Presently Associate Professor of Education and Program Advisor of the Learning Disabilities Program at Oregon College of Education, BONNIE JEAN YOUNG has had broad experience as a classroom teacher. She taught all levels of public school, including regular and special education, remedial reading, and adult education. She received both her bachelors and masters degrees from Brigham Young University and her doctorate from the University of Oregon. In addition to her duties at Oregon College, Dr. Young is a member of the Regional Resource Center Advisory Committee, Director of a project which trains students in the early identification of learning problems in children, and on the staff of the Oregon State Board of Education Evaluation Center which helps teachers to work with children who have learning disabilities.

Preface

☐ *LET'S TRY DOING SOMETHING ELSE KIND OF THING* is a synthesis of the 12 presentations from the CEC Invisible College on the Application of Behavioral Principles in Exceptional Child Education. The title of this book reflects the positive approach that behavior modification people bring to the education scene. As Invisible College participant Sidney Bijou said, "An optimistic approach is the only one you can have." From the "precision teaching" group came a similar theme--the last of Ogden Lindsley's four steps to success is, "Try, try again."

The concept of Invisible Colleges in exceptional child education emerged as the CEC Information Center began "tapping into the special education grapevine" to identify significant areas of knowledge for product development. The basic concept is as follows:

Each field of knowledge can be thought of as a pyramid. At the top of the pyramid, there are 10 to 20 leaders in that field. All new knowledge in the field either emanates from or passes among them. These people at the top of the pyramid constitute the "Invisible College." They do not depend on the printed pages of professional journals to stay on top of things but develop their own internal grapevine system of communication.

Through telephone interviews with 57 key leaders in the field, four topic areas of current, significant knowledge were identified for product development. Behavior modification in exceptional child education was one. Individuals actively involved in projects relating to the topic were also identified. Following the analysis of the telephone survey information, the next step was to plan and convene an Invisible College which would provide the information for publication and distribution to the field.

The conference planners and co-chairmen were Sidney W. Bijou, Eric Haughton, and Ogden R. Lindsley. In a planning session, these three contributors to the behavioral approach decided that, in this particular area of knowledge, new information on the application of behavioral principles should be shared with teachers, teacher educators, and others concerned with program implementation. Twelve individuals were identified and invited to participate in the Invisible College.

On March 25-26, 1971, the Invisible College met in a closed two day session. No prepared papers were required. Participants were instructed to make 20 minute presentations on their assigned topics, represented by the chapters in this book. The total group served as discussants and reactors to each presentation. The complete session was recorded.

The editors have attempted to capture the message as well as the spontaneity and enthusiasm of the presentations. Each author had an opportunity to review his manuscript before publication and to re-

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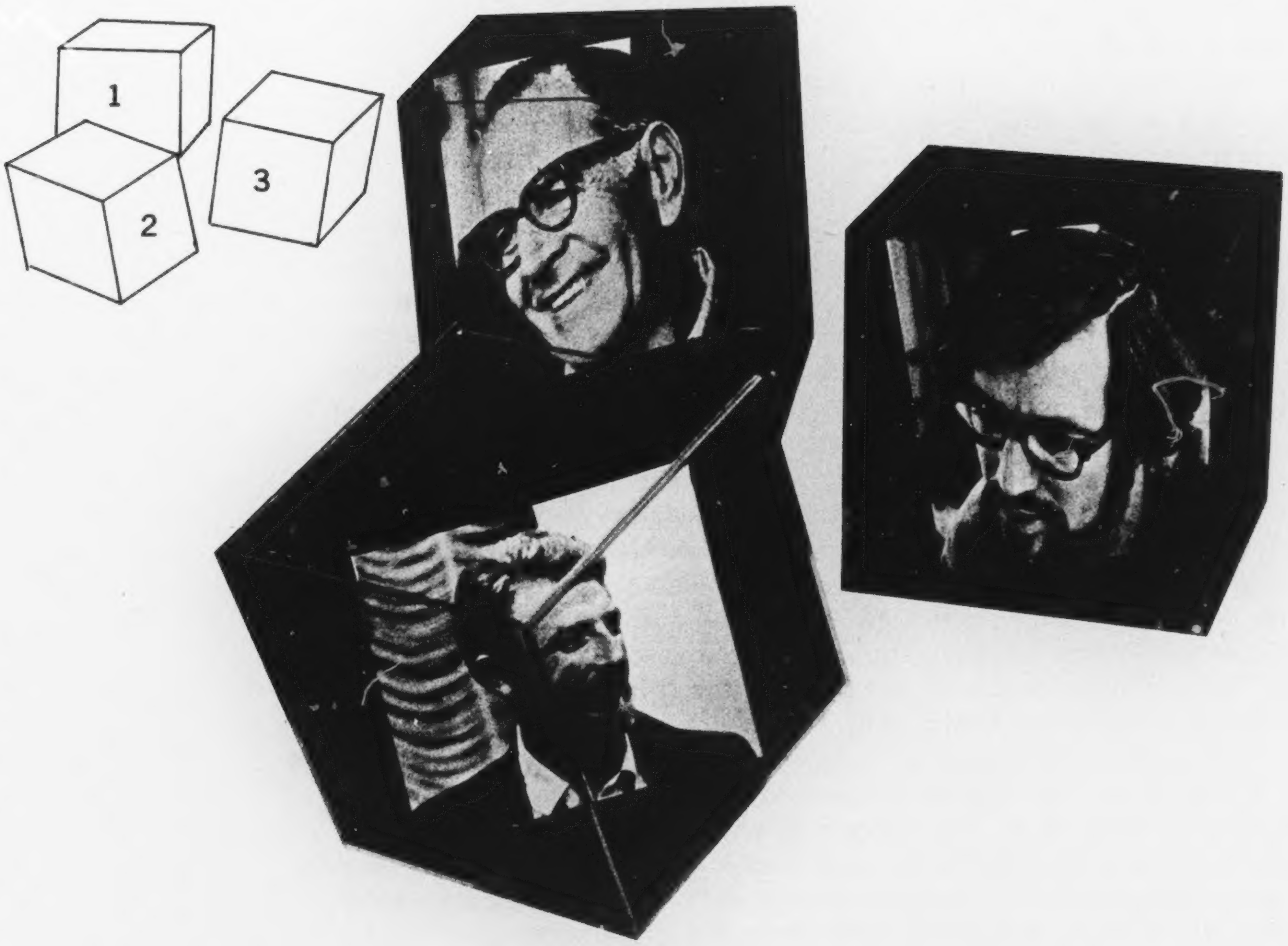
Something Else Kind of Thing

Conference Chairmen

1. Sidney W. Bijou
2. Ogden R. Lindsley
3. Eric Haughton



vise his contribution. In some instances, elements of the questions and discussion which followed presentations were also included.

Although all were behaviorists, the majority of the Invisible College participants belonged to the "precision teaching" school and presented their data on the standard behavior charts—many of which are reproduced in this publication. Thus this monograph is not intended to be a comprehensive treatment of behavior modification or to represent completely all of the different schools of thought within the behavior analysis group. Its purpose, rather, is to convey some practical application of behavior principles which can be useful to teachers, teacher educators, and others involved in the education of exceptional children.

Among the Invisible College participants, behavior terms were used in various ways, reflecting the philosophical stances of the different speakers. There were several discussions of the meaning and use of such terms as behavior modification, behavior analysis, precision teaching, etc. Participant David Phillips prepared the following summary statement which the reader may find helpful as an introduction to the material.

J. B. Jordan
L. S. Robbins

COMMENTS ON SIMILARITIES AND DIFFERENCES OF THE BEHAVIORAL APPROACH

☐ The term behavior modification is used in a variety of ways. Originally it was used to describe the clinical work of Wolpe, Reyna, and others using a Pavlovian model. Currently the mainstream stems from the Skinnerian branch of psychology called the experimental analysis of behavior and includes at least three distinct approaches as characterized by the work of (1) Bandura, (2) Bijou, and (3) Lindsley. Each brand of work differs from the others in several ways. Bandura and his co-workers include the use of hypothetical constructs as explanatory devices whereas the others do not. Bijou's approach is characterized by the strict application of behavioral principles derived from operant laboratory work, and is characterized by the development of a technology of teaching. Lindsley's work is marked by emphasis on charting procedures and has become known as precision teaching.

Behavior modification as represented by Bijou is concerned with the application of behavioral principles to applied settings. Operationally, the major breakdown of a behavioral event into its component parts includes: (1) antecendent events such as programing, prompting, priming, etc., (2) the response itself, and (3) consequent events such as reinforcement, punishment, and variations of these. Above all, this approach is an empirically controlled set of operations resulting from laboratory findings in the area of operant conditioning. It avoids the use of hypothetical constructs and focuses on observable, measureable behavior. The practitioner generally goes through the following steps in dealing with any behavior. First, the behavior of interest is precisely defined in behavioral terms. Second, the frequency of the behavior over some unit of time is recorded. Third, antecedent and consequent events are manipulated in an attempt to change the frequency of occurrence of the behavior. Fourth, there is continued frequency measurement of the behavior to determine the effects of the manipulations, and the system is adjusted on the basis of this feedback.

An outgrowth from behavior modification is that area now referred to as precision teaching. Sharing some of the basic assumptions and techniques of behavior modification, precision teaching has its unique aspects. Primarily, it stresses the measurement and charting techniques developed by Ogden Lindsley. This approach uses six cycle log paper for daily charting procedures. Movements are recorded on a per minute basis by the individual attempting the behavior change or by teachers or clinicians when the student or person involved cannot perform this himself. Although behavior modification also uses a similar measurement component, it does not use the log paper or stick to the movements per minute basis. Behavior modification uses this measurement component as a means of evaluating the effectiveness of other aspects of the program while precision teachers feel that recording and charting by the individual are reinforcing in themselves.

Thus the main difference appears to be in the emphasis on measurement versus the attention given to all aspects of teaching and learning. Precision teaching measures frequency of behavior not only for evaluation but as a change procedure, i.e., charting changes behavior. Behavior modification uses the measurement only as one part of a complex set of procedures used to change behavior, and more attention is given to antecedent and consequent events and their interaction with the behavior. The two schools of thought, however, do share optimism about the ability to change behavior in desired directions based on the behavioral principles of operant conditioning.

David Phillips

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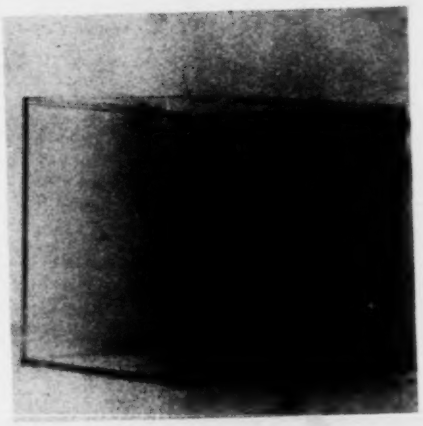

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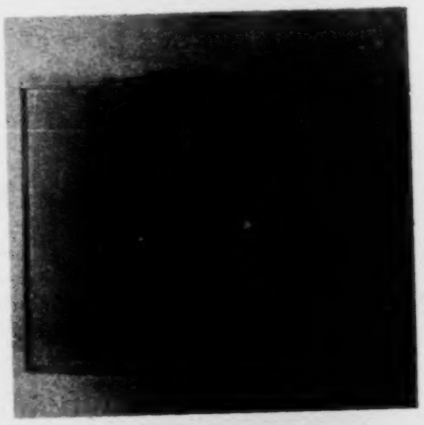

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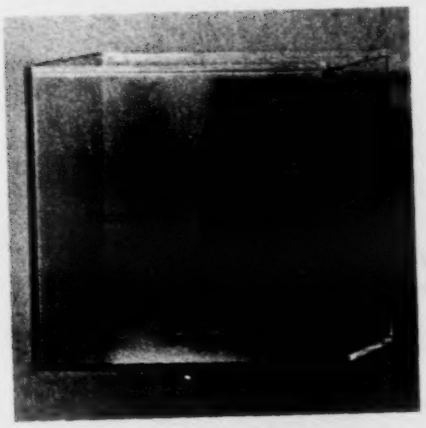

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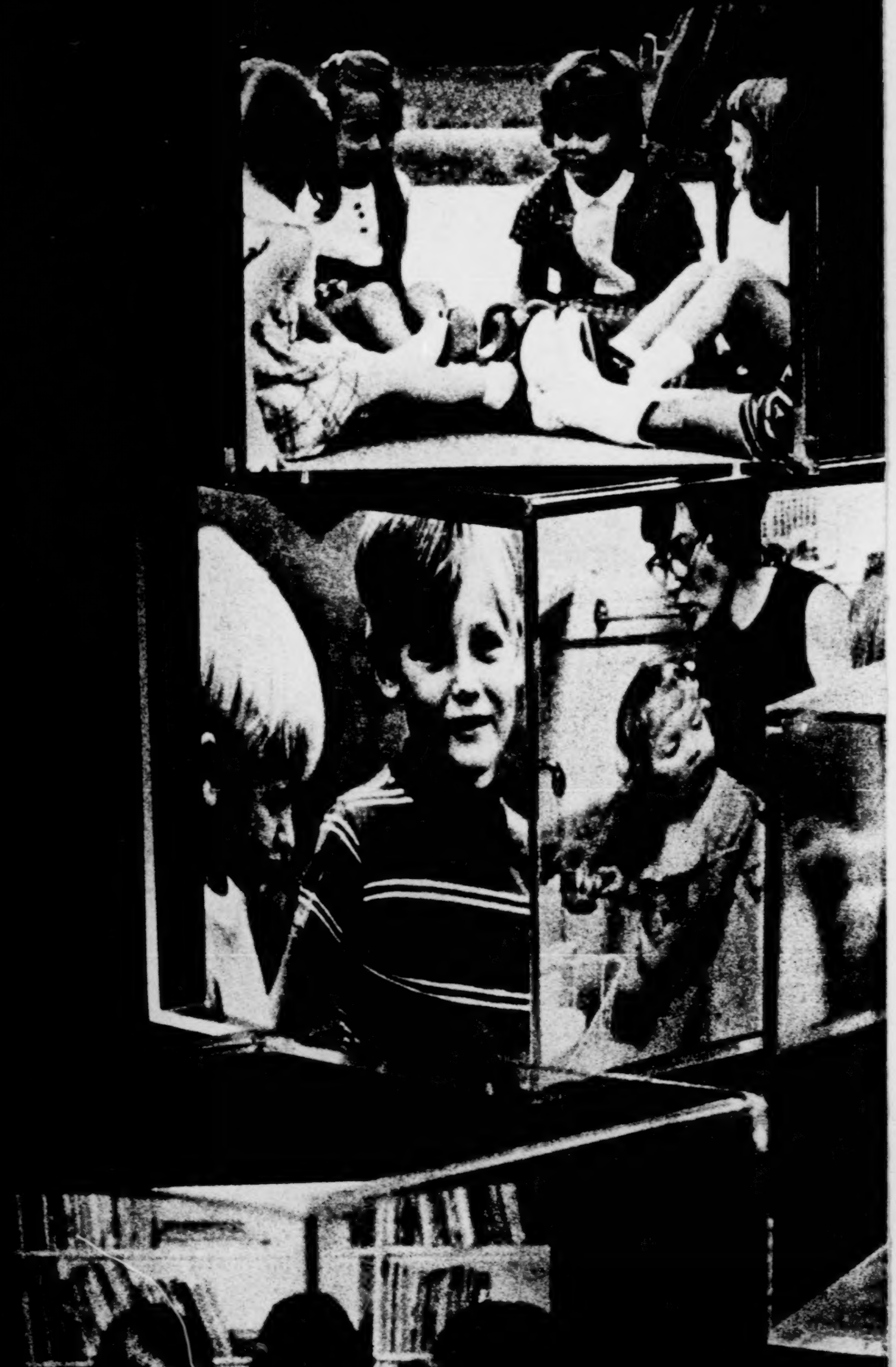
LET'S TRY DOING SOMETHING ELSE KIND OF THING

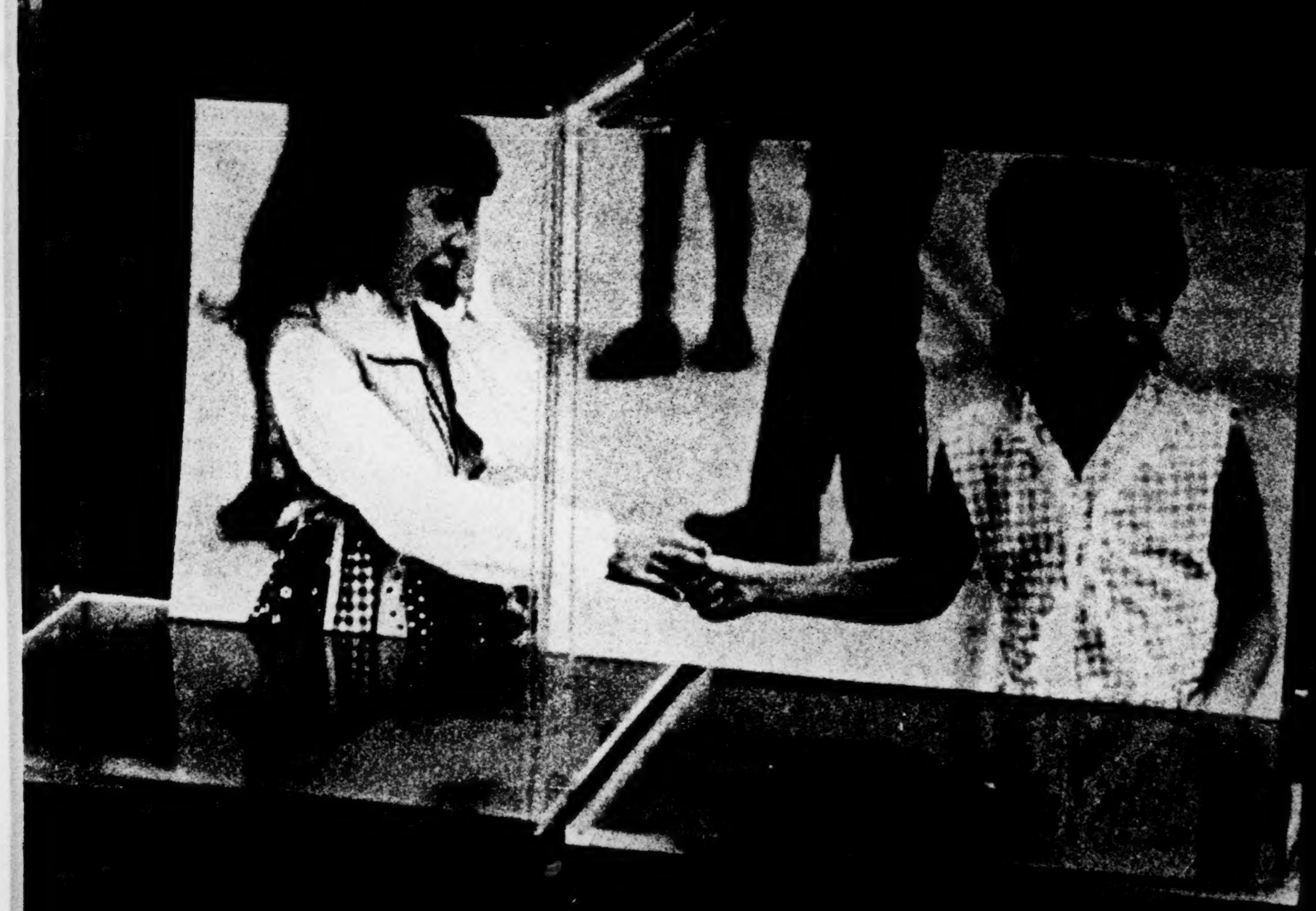
Behavioral Principles and the Exceptional Child

From Skinner to Precision Teaching: The Child Knows Best

OGDEN R. LINDSLEY



Ogden R. Lindsley, the moving force behind precision teaching, gave credit to the method's "ancestors" in his presentation. He traced the changes made in Skinnerian operant conditioning techniques and language as they moved from the laboratory to the classroom. Scientific terminology slowly gave way to precise common English that even first graders charting out their own behavior could easily understand. Lindsley also stressed the importance of those immediately involved in using precision teaching—exceptional children and their parents and teachers—in making this a usable and effective technique instead of a remote laboratory method. "We've got to put the most powerful things in the future of our culture together," he said, "and be very, very careful to share." The more simple and specific precision teaching becomes, the more people can share and benefit from its techniques.



SOURCES AND PRODUCERS OF PRECISION TEACHING

Exceptional children, teachers, and parents produced precision teaching.

☐ The source of precision teaching, of course, is the operant conditioning methods developed in the laboratory. But the real *producers* of precision teaching as a unique method are in special education. They are exceptional children and their teachers. If those children had not been able to communicate their skills and abilities and needs, and if their support personnel had not let the information come from child to teacher to me, I would not have had the information which forced us to change some of the strategies of operant conditioning and behavior modification into precision teaching techniques. I also want to say that one of the strong things that made me decide to leave the laboratory and go into education was the work of Sid Bijou in his lab preschools in Seattle. He had done some very interesting, very exciting work which led me to believe that maybe we could study children learning in their natural environment and that we didn't need to put them in a box, cell, or laboratory. I'd also like to give credit here to Ted Ayllon and Eric Haughton and their work in shaping up the behavior of chronic psychotics in Saskatchewan.

SKINNER'S STRATEGIES RETAINED

The behaver knows best.

☐ Remembering that teachers and children are the real source of precision teaching, we must go back a little in history to Skinner who developed operant conditioning. From his work we derive several strategies. First and most important: the child knows best. Skinner said the rat knows best because it was the rat's behavior he was studying. This is the principle we apply to people. The teacher knows best if we are talking about teacher behavior, but the child knows best if we are talking about child behavior.

The second important thing we get from operant conditioning is recording the frequency of behavior. Skinner called it rate, but we've had trouble with that word because the general public does not realize that it means "number of behaviors divided by the time it took to count it." Thirdly, standard charting (a cumulative response record) and its efficiency were Skinner's hallmark. Skinner himself said in 1968, "My major contributions are rate of response and the cumulative response recorder."

Frequency is a behavioral compare-all.

The concept of rate or frequency is important to us because it is a behavior compare-all or "universal datum" in Skinner's words. You can't find a behavior which has no frequency, which means you can compare any two behaviors using frequency. We found recently that changes in frequency over weeks (celeration) are also universal and easy to get from our daily behavior chart. So acceleration is a learning or behavior change in frequency. We can compare, for example, the acceleration in dressing produced by smiling at a retarded child with the acceleration in algebra produced by a slight change in the mathematics curriculum of a gifted teenager. And we can say that the rewarding smile for the retarded child was one half as accelerating as the curriculum change for the teenager. Thus we can numerically measure differences in improvement between children or between curricula or between school districts.

It is only a small step from an objective acceleration number to compare child improvement to dividing it by the cost in dollars and we have our product statement for cost-benefit budgeting and the PPBE system. Using the same charts that children and teachers use to improve classroom teaching decisions for budget planning will save districts lots of money by getting two birds with one stone. Costly regular examinations will no longer be necessary.

Frequency can be important to the Business Office too.

So we've retained from operant conditioning the strategy of looking at frequency in multiples and the strategy of self-charting. Skinner used to say that we've got to externalize behavior and get it on the recorder. "It should be noted that at no point does the experimenter intervene for purposes of interpretation." Thus you have no observer reliability problem. Another important element of the laboratory developed techniques was to record exactly what we manipulated or reinforced. In the lab that might mean the payoff electrical circuit should go exactly to the microswitch which does the recording. That is important in classroom measurement. We should record exactly what we reward and are trying to teach.

Another detail of self-recording we've retained from Skinner is an interest in inner behaviors. He called them "private events" and said their functions and laws were no different from those for outer behavior. He hadn't studied inner behaviors, he said, because he hadn't yet discovered a way to record them. People, however, as opposed to rats and pigeons, can record their own inner behaviors much the same way they record their own outer behaviors. Continuous and complete monitoring is very important for both. United Airlines has computers continually tape recording characteristics of their planes in flight. They call this "predictive maintenance." When a carburetor—or a child—is heading for trouble, continuous monitoring gives early warning. Continuous monitoring of behavior frequency was the rule in laboratory operant conditioning. Description rather than explanation was the strategy.

Self-charting provides a record of inner behavior.

Continuous and complete monitoring gives early warning.

This leads us to descriptive or *functional* definitions, one of Skinner's major conceptual contributions. For example, Skinner functionally defined reinforcement. By putting an adjective describing the effect before the noun describing the procedure you can easily separate function from procedure in basic English. This is the easiest way to share this important distinction with children, parents, and teachers. You can have effective signals or ineffective signals, accelerating signals and decelerating signals, frequency multiplying arrangements, and celeration multiplying curricula. And you can also have rewarding rewards, ineffective rewards, or punishing rewards. If you attempt to reward and the behavior decreases, like it or not, you have a punishing reward [Figure 1].

Functional definitions: e.g. the "punishing reward."

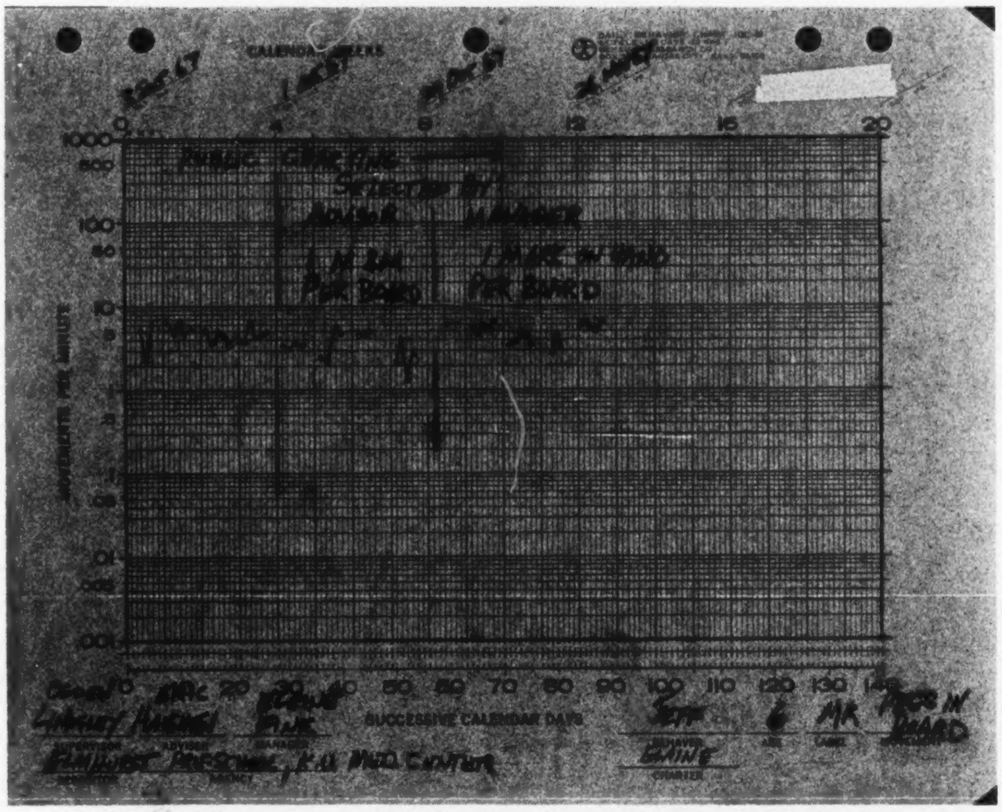


Figure 1. The Punishing Reward: M&Ms Decelerate Desired Behavior

Using our language more precisely, we separate what we did from what we had planned to do. We can distinguish our results from our hopes and thus reduce confusion in sharing our classroom experiences.

BEHAVIOR BUILDING

☐ We have also retained behavior building. Almost all of early operant conditioning involved demonstrations. In the early fifties we compelled attention by demonstrations of exceptional skill in producing dramatic and unusual behavior. We synthesized behavior in making pigeons play ping-pong. We did not analyze behavior into its parts, or succeed in finding what part of a rat was most important to its figuring out how to run through a maze. We produced behavior; we did not analyze it.

It was skill in producing behavior that convinced the pioneers. What made me an early operant conditioner was that only one month after learning the method, I was able to learn from Samson Rat how to teach him to lift over 250 percent of his own body weight in only four days of training. Skinner knew this and used to say, "The animals make operant conditioners; I don't."

The behaver goes at his own frequency and celeration...

We should also remember that in *free* operant conditioning the behaver is free to behave at any moment. There are no trials (as there are in controlled operant conditioning), just learning or class periods.

The pigeon in his chamber or the child in her classroom can go as fast and as far as their abilities permit—all limits are theirs alone.

...and has personalized procedures.

Another important point which is often overlooked is personalized procedures. Skinner and I, he a full professor and I his graduate student, once spent a whole Saturday hunting for a special kind of millet for a pigeon that wasn't performing at as high a frequency as other pigeons. Our searching for millet to fit this particular pigeon—RGY-32—was like the School Superintendent and a student teacher driving 200 miles on a weekend to find a unique curriculum for kooky Tommy. And I think this is the most important element to retain . . . different strokes for different folks!

SOME LAB TECHNIQUES ABANDONED

☐ There are certain elements of laboratory operant conditioning we had to prune away to develop precision teaching. We had to abandon the isolated environment of the laboratory. As I said before, this was Bijou's and Ayllon's and Haughton's contribution, to bring us lawful data from classrooms and wards.

Secondly we had to abandon deprivation. Although technically feasible, it is immoral to teach children by placing them in closets and depriving them of lunch, when rearranging their curricula would be as effective and less costly.

Extrinsic rewards relegated to emergency procedures only.

Also, we had to abandon synthetic or extrinsic consequences, except in emergencies, as too costly and unnecessary. Occasionally extrinsic rewards backfired and produced deceleration—actually being punishing rewards as shown with the M&M candy in Figure 1.

And again in the classroom improvement project shown in Figure 2, we see that "the child knows best." I, as supervisor, and Mike Dixon, the advisor, suggested a piece of M&M candy as a reward for each numeral said correctly by Rodney, a 6 year old boy bearing the label "emotionally disturbed." Under this "reward" his correct frequency divided by 1.5 each week—deceleration! A punishing reward!

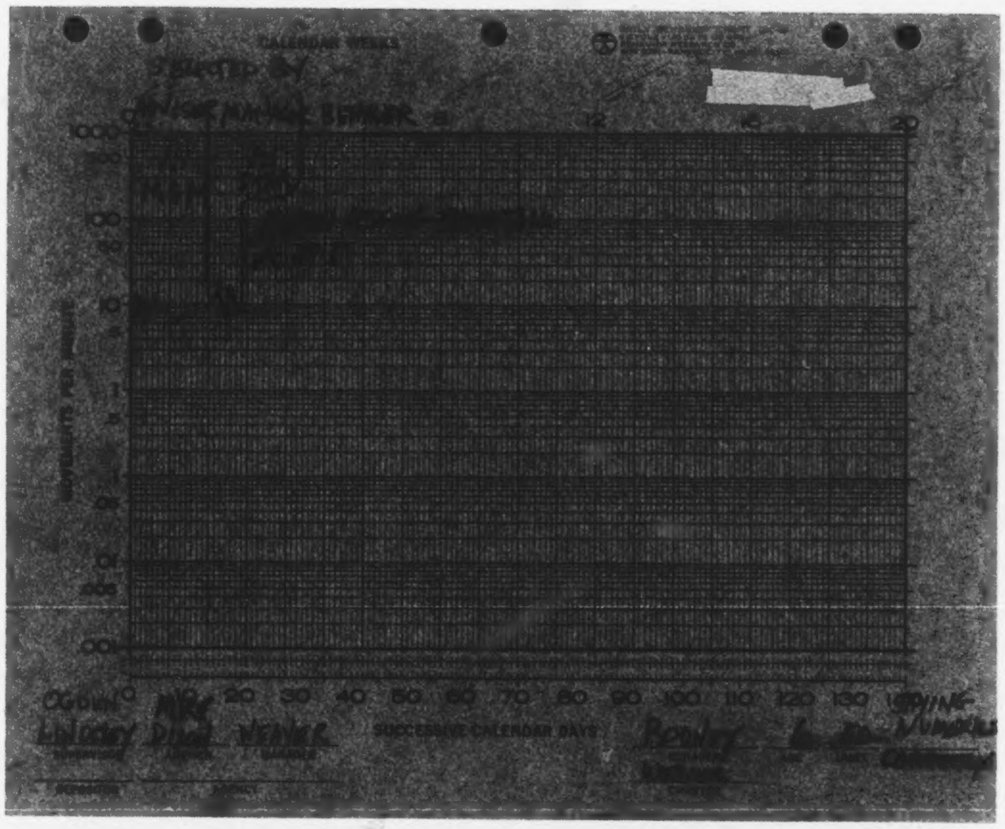
The next person to try a helping procedure was his teacher, who suggested a star for each numeral said correctly. At first, the use of stars multiplied his frequency by 2, but as the week of stars went on, that frequency divided by 1.5. Rodney worked twice as fast, but he was losing interest at the same deceleration!

As is so often tragically the case, the last to be asked for suggestions was the behaver, Rodney. With a gleam in his eye, Rodney said, "What I would like best is when I finish my lesson, you talk to me a bit." This multiplied his frequency of numerals said correctly by 3.0 and his celeration or growth by 2.0!

Stop using consequences which are not part of the classroom; get suggestions from the children.

After many experiences like this it became clear that if we were to remain scientists we must stop advising teachers to use consequences which are not part of the classroom, and urge our teachers to get suggestions from their children. With our charts to guide us we have no fear; the data tell us when we are going in the wrong—or right—direction.

Figure 2. The Behaver Chooses His Own Reward



We also had to abandon mechanical recording. In 1965, in Shawnee Mission, Kansas, we surveyed a group of teachers to find out what classroom behavior they wanted us to work on most. Immediately, you see, we had ruled out the children. The teachers were most bothered, they said, by talkouts and secondly by children jumping out of their seats. Harold Kunzelmann developed an automatic recorder to screw on the bottom of the seats to record the number of times weight came off the chair. To get baseline data, teachers started counting and charting out-of-seats before the boxes were installed. The problem was that many of the teachers got rid of the out-of-seat behavior before Harold could get out to their classrooms with his recorders. So there were two alternatives: to hold up teachers while we screwed on gadgets and published on behaviors that could be mechanically recorded or to become classroom teacher oriented and work with teachers and their skills and needs. So out went mechanical recording.

SIMPLIFYING THE LANGUAGE

Laboratory jargon just had to go.

☐ The next thing that had to go was laboratory jargon. The language of operant conditioning is confusing and difficult. It is not precise. And for self-charting, we needed terms in basic English so that second and third graders would know what we were talking about.

Our first signal that we should pay attention to "the child knows best" happened in a classroom. We had a chart of thumb-sucks by a 12 year old boy labeled "emotionally disturbed." He was tallying his own thumbsucking, but in 1966 we didn't realize how important self-recording was, so we didn't make much of it. The thumb-sucks were accelerating on the chart before any changes were made to improve the situation. Since it was worsening, Martin Bisaha, the teacher, said, "Why don't you use this to decelerate your thumbsucking?" And the little boy took the role of scotch tape from Martin's hand and put a piece over his well sucked thumb. The chart showed a rapid deceleration of thumbsucking produced by the self-applied tape. One day Martin forgot to put out the tape roll and the boy came to him and said, "May I have my little helper?"

Are decelerating consequences not punishers but really helpers?

When Martin told me this in a teacher training class a few nights later, I thought, Wow! If the child knows best what it means to him, we can't call it a punisher. It's a helper, a reminder. It's not a hurter, not a punisher. That was one of the very first clues we got that we should change some of our words and look more closely, more precisely at what people say about their own behavior.

This going from our beloved laboratory jargon to precise common English was very difficult and took years. The process is still going on. I think it is so hard because it involves changing our own thought processes—how we have been taught, at great expense, to perceive things. Here are some other examples of the changes we made.

Look more closely at what people say about their own behavior.

We gave up "rate" in favor of "frequency" because people thought we meant quality (rating sheet) or value (first rate) or speed (which is distance over time). Frequency is much less misunderstood. Also some teachers, when they heard the word rate, felt all we were trying to do was increase reading speed instead of both accuracy and comprehension.

When we referred to "steep and shallow slopes" of the frequency lines on our standard chart, many thought it had something to do with skiing. Also we had trouble separating "up-slopes" from "down-slopes." Now we talk of "acceleration" and "deceleration" which are more easily connected with changes in frequency by most of us.

Discussing a logarithmic scale scared many and confused the rest, so we went to "ratio scale" which only helped a portion of us. We've recently found that the best word for elementary teachers and children is "multiply-divide" scale (Figure 3). As you go up the left of the chart by equal distances, you multiply the numbers by equal amounts or factors. If you come down by equal jumps, you are dividing by equal amounts at each jump. This seems to tie in better with people's ordinary vocabulary and the elementary math curriculum.

Some people thought logarithms were dancing logs!

We began by describing the parts of the chart by the method we had last learned—formal mathematics. Thus what went up the left we called the ordinate and what went across the bottom was the ab-

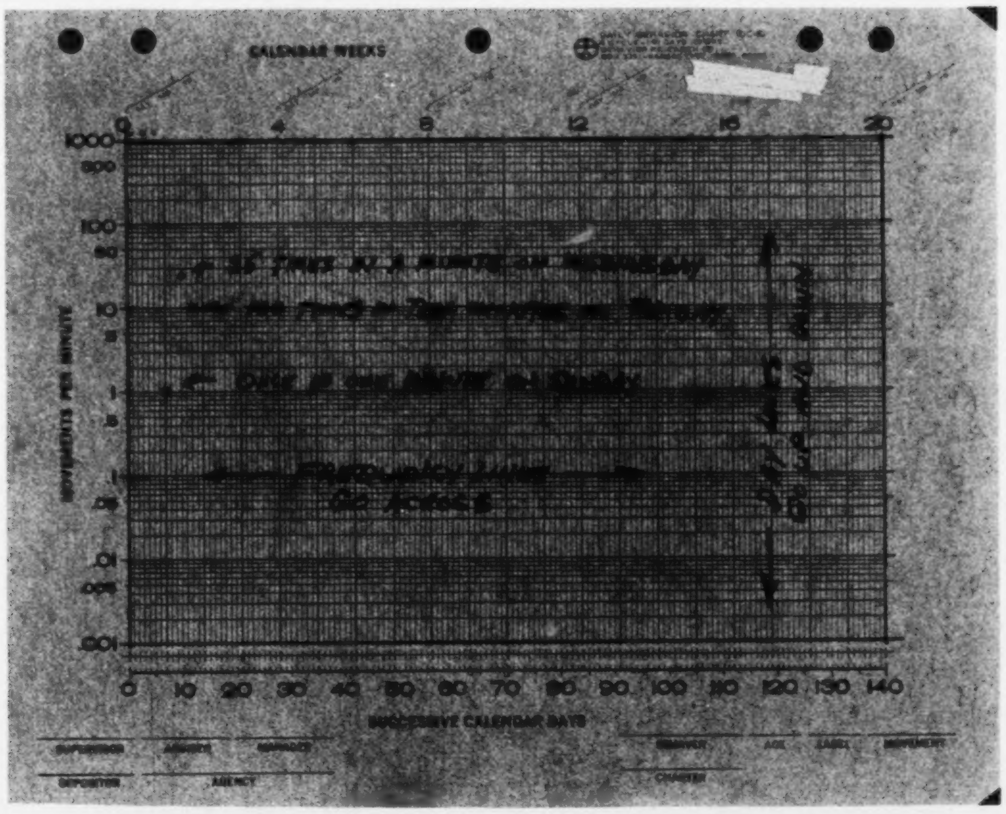


Figure 3. The Multiply-Divide Scale Simplifies Reading the Behavior Chart

We began describing the parts of the chart by formal mathematics. . .and had a lot of trouble teaching it.

scissa. And we had a lot of trouble teaching the chart. Then two years ago, we heard Stephanie Bates, a 5 year old kindergartener teaching the chart to others in her class, say, "See the dark blue lines that go up and down. They are Sunday lines. All the lines that go up and down are day lines." She was telling what you *see* and what you *do* on the chart. You put a dot where the Sunday line crosses the one-per-minute line if you did something once in a minute on Sunday.

We were brought back to precise basics by our children and teachers.

We had been remembering our plane geometry and not paying attention to what we did on the chart. In exactly this way we abandoned the abstractions we had learned and were brought back to precise basics by our children and teachers.

We went from "operant level," which was our old laboratory word for what the behavior frequency was before you rewarded it, to "base-line" and finally to the simple "before." A similar simplification trip was from "experimental conditions" or "independent variable" to "intervention" to "during," as in *during* SRA level 2.5 or *during* five minutes of listening to language tapes for each 10 math problems correct. "Extinction," which described taking out the procedure to see if the effect was durable and confusingly also described the disappearance of the effect if it was not durable, became merely "after."

There was even difficulty with the name of our whole system. In the Midwest, the most common response to the words "free operant conditioning" was that it was a way of waterproofing shoes. We didn't want to have to unteach shoe waterproofing so we went to "behavior modification." Many parents said that didn't say anything. They thought we were saying, "We are going to modify your child's behavior by behavior modification." That meant nothing to them. Thinking that what was really new in our procedure was precision, we decided to use that as an adjective in front of whatever it was one was doing: hence, in our case, "precision teaching."

What is really new in our system is precision.

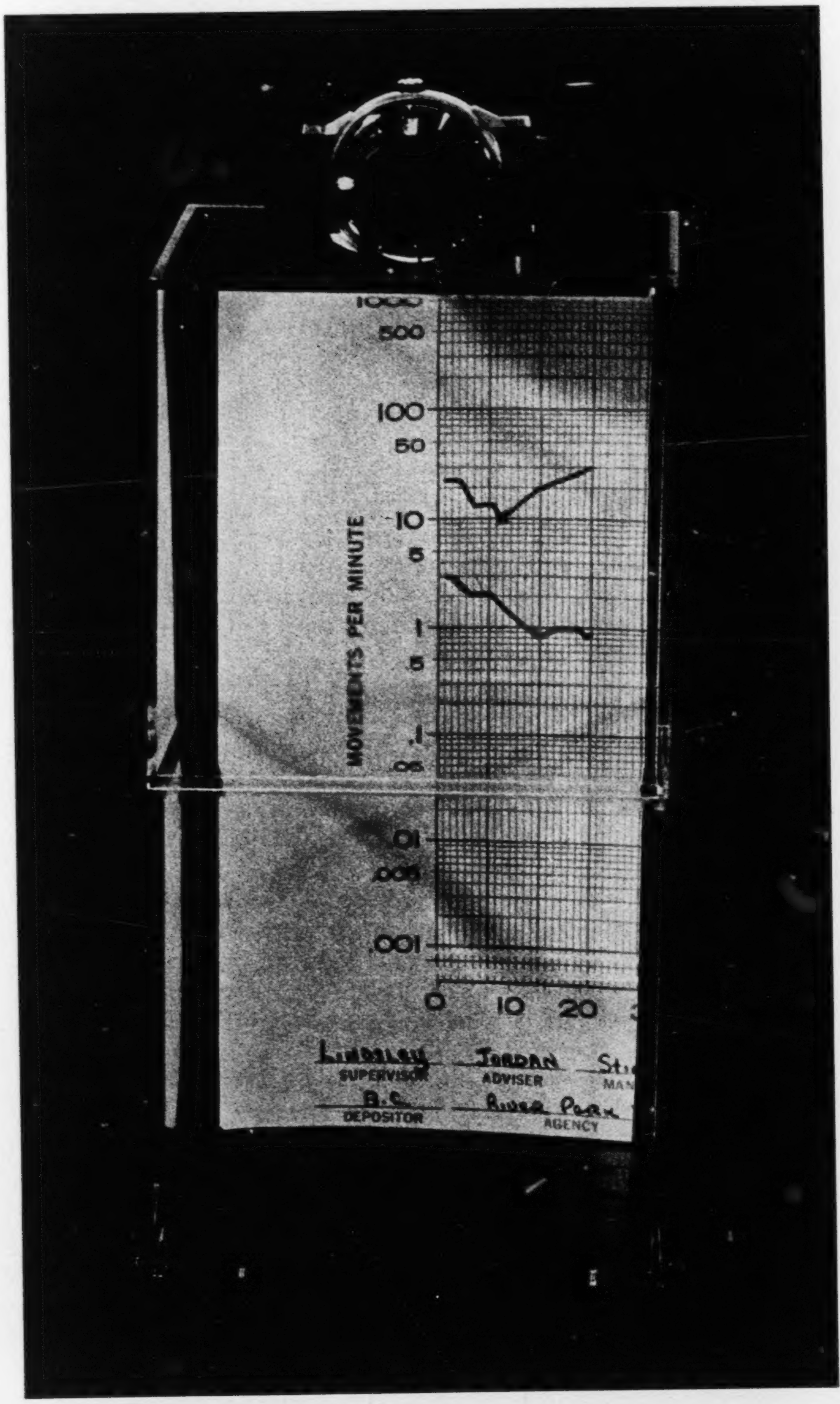
"Subject" was our first word for the person whose behavior was being charted or improved. Its most common meaning is "one who is placed under the authority, dominion, control, or influence of something else. One who is bound in servitude to a feudal superior; a vassal." Since we didn't want to vassalize children, that had to go. So for several years we used the term "protege" for the person whose behavior was being charted and improved. In an inservice workshop in Hibbing, Minnesota, a lovely teacher told me at the coffee break, "Dr. Lindsley, that word protege is too high-brow, it just has to go! Find a word that has something to do with behavior." So I got the courage to search again, and it was like a breath of fresh air when we discovered the word "behaver."

We had to discard the word "reinforcer" along the way. This also hurt because the word was introduced to the academic community by my dearly beloved teacher, B. F. Skinner, and was one of our old hallmarks. Regretably though, to most practitioners the most common meaning was "bridge abutment." In the plural it produced "military troops" as the most common understanding. Awkwardly we played around with "accelerating consequence" for a while, but it is hard to say and harder to teach. I think that now, with our charts and 12,000 behavior improvement projects stored in the Behavior Bank's computers, we have enough hard science to be secure enough to talk like people again. We can start using basic English precisely with functional adjectives like effective reward, untried consequence, punishing reward, and rewarding punishment.

We now have enough hard science to be secure enough to talk like people again.

The term "pinpoint" was suggested by Ed Sabastian, one of the fathers in our first parents' class in 1965. The class was rapidly being turned off by my scientific jargon. Pinpoints are the things you have selected to count in behavior improvement projects. As Ed said, "You pinpoint a behavior for action." And the things you use to change behavior we now call simply "procedures" or "changes."

"Experimentally analyze" was a term dear to my heart, for I had been a victor in the academic war that introduced the term to professionals. But our teachers didn't want to experiment and they don't like to analyze. And to make matters worse, the things we called experimental analyses (note the difficult plural spelling) were neither


MOVEMENTS PER MINUTE
1000
500
100
50
10
5
1
.5
.1
.05
.01
.005
.001
0
10
20
Lindsley
SUPERVISOR
Jordan
ADVISER
St
MAN
B.C.
DEPOSITOR
River Park
AGENCY

true experiments nor analyses in the strict laboratory sense. In laboratories you pay thousands for the controls required for true experiment and analysis.

So we talked about "pragmatically selecting" things for a brief while and soon translated that into my grandmother's law: "Try, try again." As Grandmother Lindsley used to say, "Ogden, you will not at first succeed, so you just try, and try again." Figure 1 shows two of these tries: the M&M's and the marks on the child's hand. Figure 2 shows three tries: the M&M's, the stars, and the talk at the end of the lesson.

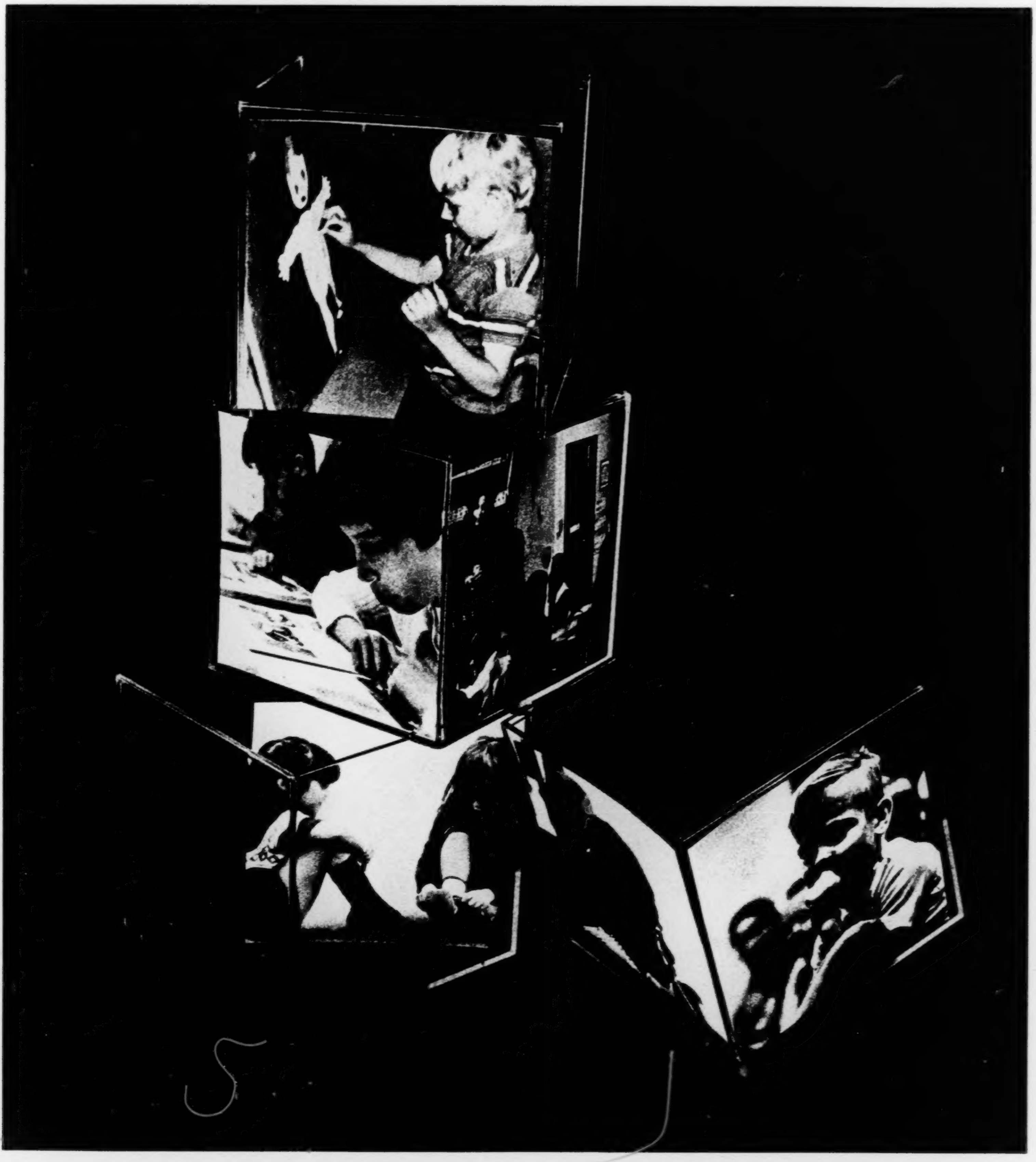
Grandmother Lindsley's law: Try, try again.

To cover briefly a few more changes in terminology, we went from "private events" to "mental events" to "inner behavior," and from "public events" to "physical behavior" to "outer behavior." From "self-control," which implies a false duality, we went to "personal management."

PRECISION TEACHING CONCEPTS: ALIVE AND COMMUNICABLE

Four steps to success: pinpoint, chart, change, and try, try again—with love.

☐ So these were some of the ways we dispensed with our laboratory jargon and still kept our priceless concepts alive, but now in a more communicable form. This gave us our four steps to success: pinpoint, chart daily, change something, and try, try again. Mix them well with your humor and love, and your children's successes will be yours.



Sharing a Message about Curriculum with My Teacher Friends

ANN STARLIN

Ann Starlin is a classroom teacher in Bemidji, Minnesota. She is a precision teacher. With the information available to Mrs. Starlin through continuous measurement, she is able to maintain flexibility in her instructional approach and create an educational environment where each child can function as a unique individual. In her presentation, Mrs. Starlin explained how children move through their individualized curricula at their own rates.

TRY SOMETHING NEW

☐ My hope is that the material presented today will be helpful to teachers and be exciting enough to help you rearrange your classrooms to try something new and to start measuring your students on a daily basis.

LET'S LOOK AT EACH CHILD INDIVIDUALLY

☐ As classroom teachers one of the biggest problems we have is knowing how to match available curricula to our students. Whether we are special education or regular education teachers, we need to look at our students and find out how to keep flexible with each one of them in order to assure that each will progress individually in academic and social areas.

We have to take part of one curriculum, put it with part of another, and come up with a unique program to fit each child.

Every child in our classroom is a very special child. Each has different colored hair and eyes and different colored skin. They grow in various sizes and shapes and think and feel differently. The combination of these various attributes creates a totally unique child each time. This is the thing that needs to happen in the area of curriculum. We have to take a part of one curriculum, put it with part of another, and come up with something that is going to fit Cheryl. At the same time we may need to find a different instruction and material to fit Ted or Linda and all of the others—in order to be able, as teachers, to assure ourselves that we have done the best possible job with each student in our classroom. For each unique student we need a unique curriculum.

How can we do this? Just this problem is what caused my husband, Clay Starlin, to begin doing a great deal of work in the area of measuring and designing a flexible model which assures individualized education for each student. With my help as a teacher we are developing a curriculum design that we would like to share with you now.

THE FLEXIBLE CURRICULUM

☐ Let's look at the curriculum overview first. We have identified three levels of Pinpointing performance (Figure I). Pinpointing means being very specific in identifying particular behaviors and is used by Ogden Lindsley as part of the terminology of precision teaching. We must pinpoint exactly where we should begin instructing a student and continuously measure to see if he is progressing.

Pinpoint exactly where to start instructing each child.

The Inventory Level includes many skills or concepts from a particular curriculum area. For example, in addition our first Inventory is sums 0 to 9. In spelling, it is short vowel words, long vowel words, digraphs, and blends. If a student can learn at the Inventory Level, we do not need to refine our pinpointing any further and can begin instructional work at this level. When the student has reached his aim, we move on to the next inventory sheet.

A second level of evaluation is the Screening Level. Here we have taken the Inventory Level and broken it into smaller units. If a student performs very poorly or not at all at the Inventory Level, we then refine our evaluation by pinpointing his performance at the

Figure 1. Mathematics Pinpointing Model

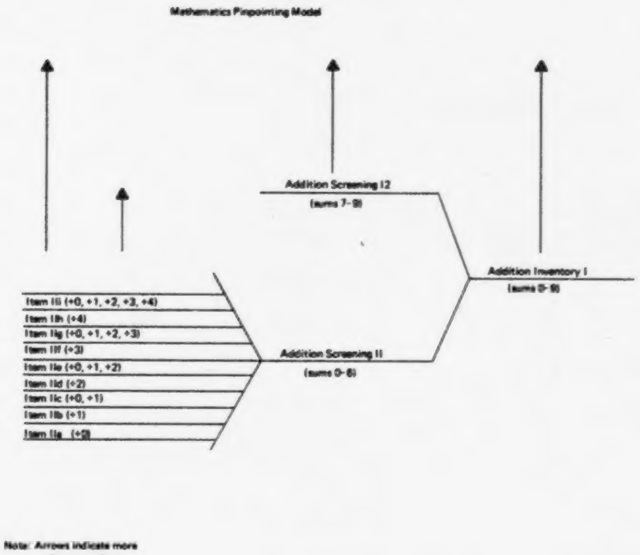
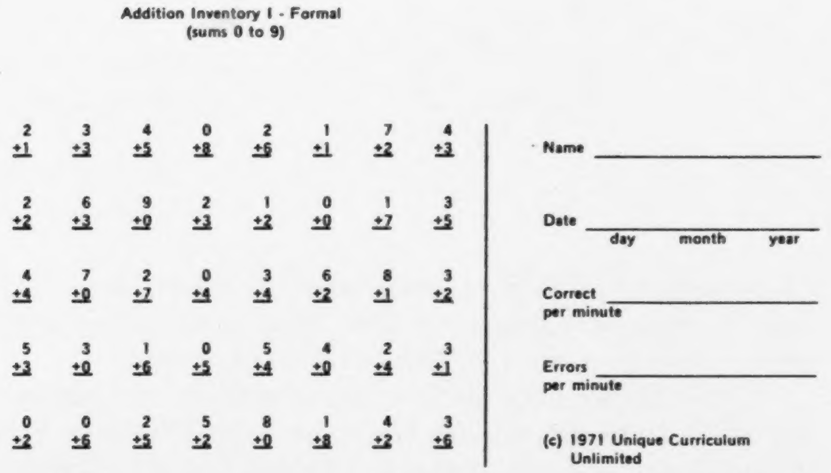

Mathematics Pinpointing Model
Addition Screening I2
(sums 7-9)
Addition Inventory I
(sums 0-9)
Item IIi (+0, +1, +2, +3, +4)
Item IIh (+4)
Item IIg (+0, +1, +2, +3)
Item IIf (+3)
Item IIe (+0, +1, +2)
Item IId (+2)
Item IIc (+0, +1)
Item IIb (+1)
Item IIa (+0)
Addition Screening I1
(sums 0-6)
Note: Arrows indicate more performance sheets.

Figure 2. Inventory I Sheet for Addition



Addition Inventory I - Formal
(sums 0 to 9)

2 +1	3 +3	4 +5	0 +8	2 +6	1 +1	7 +2	4 +3
2 +2	6 +3	9 +0	2 +3	1 +2	0 +0	1 +7	3 +5
4 +4	7 +0	2 +7	0 +4	3 +4	6 +2	8 +1	3 +2
5 +3	3 +0	1 +6	0 +5	5 +4	4 +0	2 +4	3 +1
0 +2	0 +6	2 +5	5 +2	8 +0	1 +8	4 +2	3 +6

Name ____________________

Date ____________________
day month year

Correct per minute ____________________

Errors per minute ____________________

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Screening Level. There are two screening sheets under Inventory I, sums 0 to 6 and 7 to 9.

The most refined level is the Item Level. The items are smaller units under the Screening Level. An example of an item sheet in addition under Screening II (sums 0 to 6) would be all +1 problems with answers no larger than 9.

DETERMINING APPROPRIATE LEVEL OF INSTRUCTION

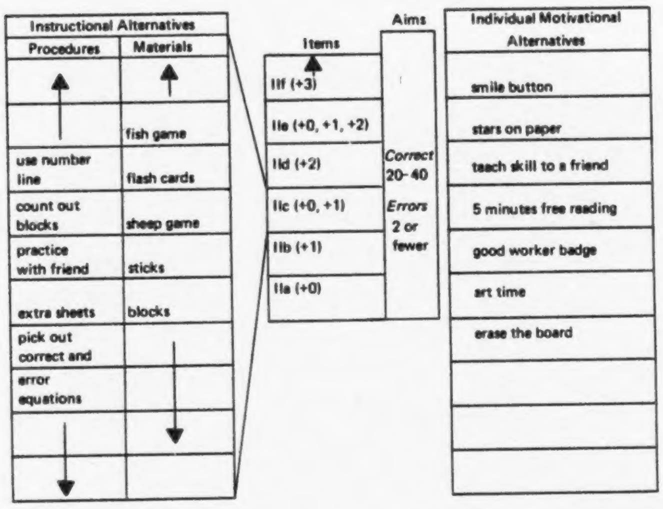
☐ The Inventory I sheet in addition looks like this (Figure 2). These are the basic addition facts 0 to 9. Each student in the room does this sheet of facts. We determine the appropriate instructional level for a student by comparing his Inventory performance to our aims for the number of errors. We have used 20 to 40 correct per minute and two or fewer errors per minute for first grade students. Those children who perform at or above this level go on to the Inventory II sheet. Those who are close to the aim but don't quite reach it would be instructed on this Inventory, and those who fall way below the aim both in correct and error performance would move to the Screening Level.

We adjust our educational program based on overall improvement, not a one day "test."

The Instructional Level is initially identified by performance frequencies (correct performance per minute and error performance per minute). As the student receives instruction at his level, we continue to measure, and the student charts his performance each day. We adjust our educational program based on overall improvement—not a given day's frequency or "test"—until he reaches his aim at the iden-

Figure 3. Changing Sheet

Mathematics Changing Model



Instructional Alternatives	
Procedures	Materials
↑	↑
	fish game
use number line	flash cards
count out blocks	sheep game
practice with friend	sticks
extra sheets	blocks
pick out correct and	
error equations	↓
↓	

Items	Aims
IIf (+3)	
IIe (+0, +1, +2)	
IId (+2)	*Correct* 20-40
IIc (+0, +1)	*Errors* 2 or fewer
IIb (+1)	
IIa (+0)	

Individual Motivational Alternatives
smile button
stars on paper
teach skill to a friend
5 minutes free reading
good worker badge
art time
erase the board

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tified instructional level. Improvement means how quickly the student is moving toward his aim. When the aim is met, he changes sheets. This is true for all areas of the curriculum.

ALTERNATIVES FOR INSTRUCTION AND MOTIVATION

☐ If the charted information tells us that the student is not progressing as we think he should, we consult the Changing Sheet that gives instructional and motivational changes for the various items of the curriculum. In this addition example of the Changing Sheet (Figure 3), we have taken the item level under the first Inventory and looked at instructional material alternatives for the specific item of +2. Just look at the number of alternatives, both materials and instructions, that you as a classroom teacher have to help each student learn his +2 facts. (The arrows indicate there are many more than there was room to list here.)

Measuring each day is the key.

When you have a list of alternatives to try with a child, how do you know which is the best one? The only way is to try one and measure. If the student's performance improves—GREAT! If it doesn't improve, then you need to try another—but remember, measuring each day is the key, for it provides the feedback necessary to make decisions.

There are also motivational alternatives to use in helping each student improve his performance. Because we are all unique, we are motivated by different things. Something that may be rewarding to me may not be to someone else. This is true in the classroom also. So again, we look at each child individually and not the group as a whole.

INVOLVING STUDENTS IN THEIR OWN EDUCATION

☐ When I first started teaching, I never even thought about what the students were doing. I was so concerned about what I was doing, and the students were doing very, very little. But this is the students' education. Therefore, we must totally involve them in their own education all the time.

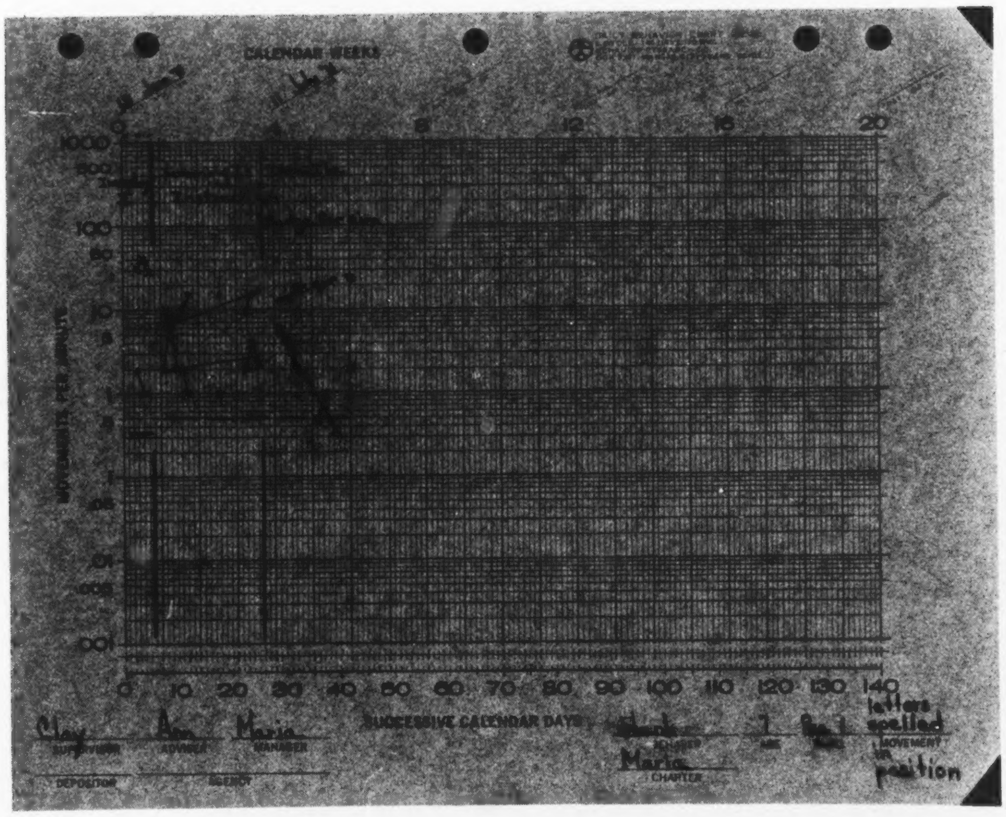


Figure 4. Hank's Spelling Chart

Every child who can, charts his own performance and shares in the making of his educational decisions. There are usually older students who can work with the younger ones. Also, students proficient in one skill can help a student who has not learned the skill yet and help keep his record. Sometimes mothers come in and help out.

Every child who charts shares in making his educational decisions.

HANK, WENDY, AND SUSAN ARE LEARNING

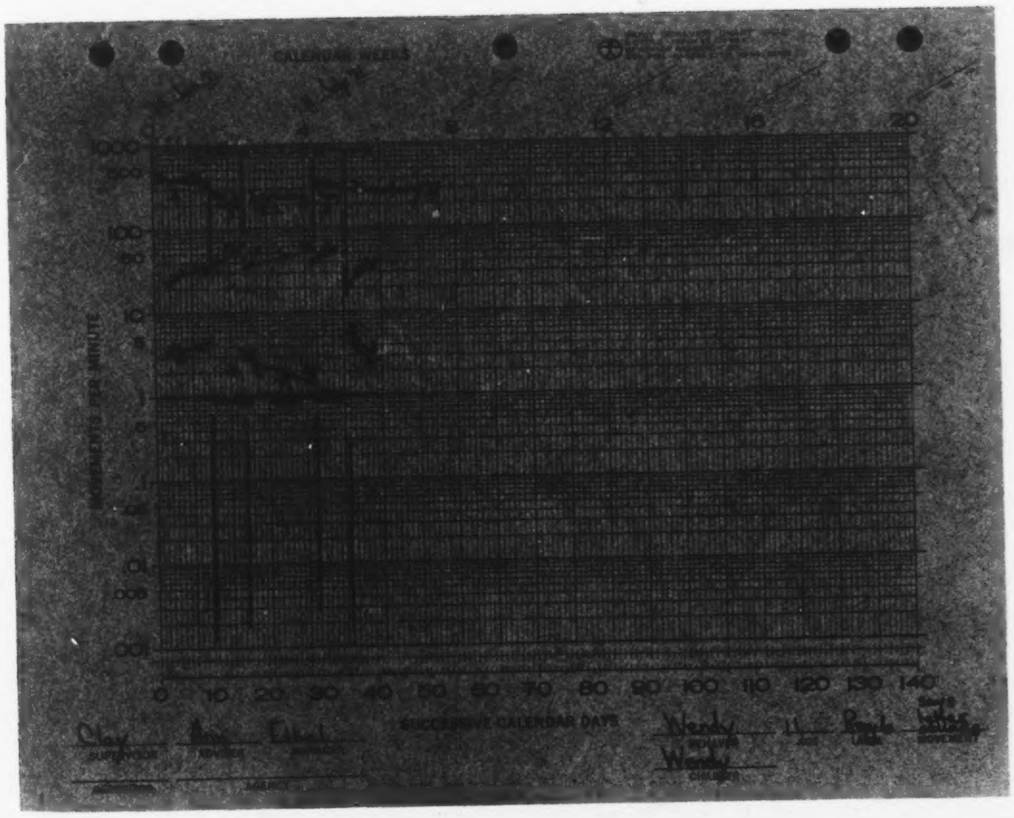
☐ Let's look at a few student charts. Here are a few things to keep in mind when looking at the charts:

1. Correct performance is indicated by a dot on the chart and errors are indicated by x's. The dots and x's represent how frequently something occurred (i.e., the number of things done divided by the time it took to do them).
2. The straight lines drawn through the dots and x's represent the improvement in learning that is occurring.
3. The vertical lines drawn in pencil separate the changes made.
4. Stars on the chart tell us the frequencies we are aiming for.

Hank was getting many more letters wrong than right, so he and his teacher decided to work on the Screening sheet.

This is Hank's spelling chart (Figure 4). It shows how Hank and his teacher Maria worked together so Hank learned to spell more letters in position. At first in Inventory I (short vowels, long vowels, consonants, and consonant digraphs), Hank was getting many more letters wrong than right, so he and Maria decided to work on the Screening Sheet II (short vowels). As you can see, his correct per-

Figure 5. Wendy's Say Sounds Chart



formance improved over these weeks. However, his errors were increasing so another change was decided upon.

Marie started dictating the words on Item sheet IIa (all short "a" words). She and Hank also decided that he could earn a badge when he reached his aim of 25 letters correct per minute with one or fewer errors per minute. The badge helped Hank reach his aim on the item sheet, and his performance improvement shows that he learned a great deal during these two weeks.

This is Wendy's chart (Figure 5). Ethel is her teacher. At the beginning Wendy was working on letter sounds Inventory I (all consonants, short vowels, long vowels, and consonant digraphs). Neither her correct nor her error performance was improving enough for her to stay on the first Inventory, so she and Ethel decided to study the sounds on Screening Sheet I1 (continuous consonants). When Wendy reached her aim of 60 correct per minute with two or fewer errors per minute, they moved to Screening I 2 (stop consonants). After Wendy reached her aim again, Ethel rechecked her on Inventory I. Wendy stayed at her aim, and her errors were only at one per minute. Now she was ready to start Inventory II ("r" controlled vowels and double vowels).

When Wendy reached her aim, they moved from the Screening sheets back to the Inventory level.

HOW CAN I DO THAT EVERY DAY WITH EVERY CHILD?

☐ When we measure *every day*, we find that some days we only have to make changes for two children, because the others are doing just fine. Other days we have to make changes for ten children, and those

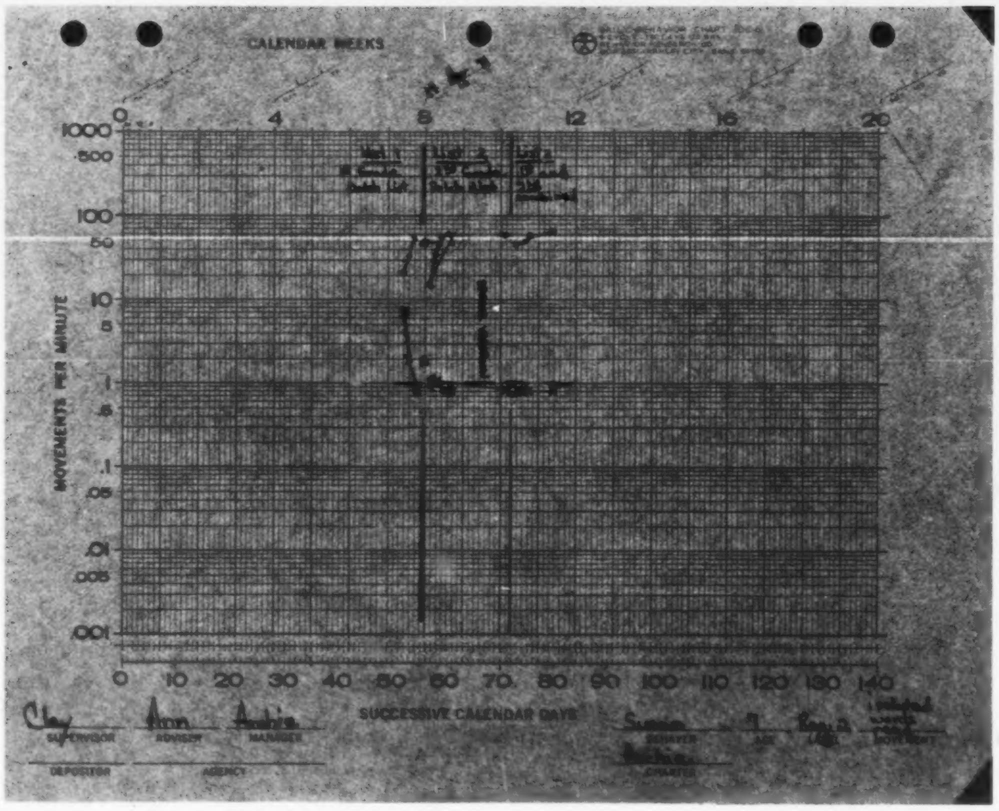


Figure 6. Archie Teaching Susan a Word List

are the days when you go home very, very tired. But the students can help you by helping each other. They can learn to make their own educational changes and share responsibility with each other.

This chart of Susan's shows how Archie, a fellow second grader, helped her learn some sight words that she was having trouble reading (Figure 6). Archie is the charter as well as the manager. At first Archie helped Susan with the first grade Dolch list. Archie knows them, that is why he got to teach them to Susan. He obtained a one minute sample of Susan's performance every day and charted it. Archie is such a good teacher that Susan learned the first list in three days. They had decided that 50 correct per minute with two or fewer errors per minute was their aim. When Susan reached this aim on a list, they went on to a new list.

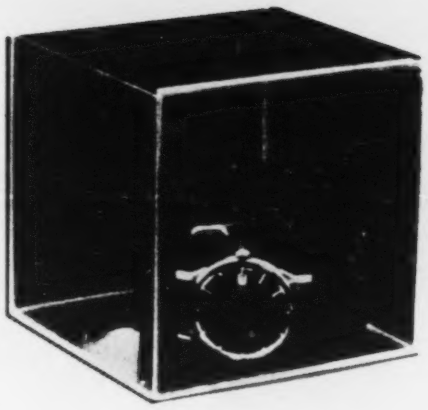
Archie knows the words, so he gets to teach them to Susan.

It is certainly helpful to have many good teachers in the room. By keeping behavior charts and teaching each other new things, all students learn the thrill of *helping* one another and *being helped* by a friend.

The students help you by helping each other.

ALL CHILDREN ARE SPECIAL

☐ If we wish to maintain flexibility in matching curriculum to particular students, we need to pinpoint each student's instructional level and continuously measure his improvement. When we have done this, we are in a position to build educational programs that truly treat all students as special.



Aims—Growing and Sharing

ERIC HAUGHTON

How do you know when a child has really mastered a basic skill? Or when he can be successful at a more complex task? Eric Haughton explained the derivation and importance of setting carefully selected aims for children to make sure they can progress at their own rates. These decision points on the precision teaching charts mark proficiency levels in the skills youngsters need to master before they begin the reading, writing, and math curricula of our elementary schools.

925
3548

AIMS AND ACCOMPLISHMENT

☐ Suppose there was a land in which there were no hills and no apparent sky. Would there be explorers? In our world, man has always travelled to discover what is on the other side of hills, to follow a constantly receding horizon. It is a truism now to say man climbs mountains because they are there; they provide a challenge and an easily recognizable aim. The Matterhorn, Mt. Ranier, Fugii, have all been climbed, and finally Everest was conquered in 1953. Only 16 years later, man has walked on the moon—which is roughly 40,000 times the distance to the top of Everest. Some "step for mankind"!

When we establish aims precisely and clearly, and set out to achieve them, we do accomplish our goals.

Man's imagination has taken him from earthly steps to "stepping" at around 20,000 miles per hour. Now we are discussing manned flights to other celestial destinations. Apparently, when we establish our aims *precisely and clearly* and set out to achieve them, we do accomplish our goals, often creating new benefits to man in the process, like the hundreds of new humane developments from the space program. The imagination of man succeeds remarkably in providing a way to accomplish an *agreed-upon* aim.

Specifying and reaching a goal is not necessarily an end in itself, however. Among our many mountains, we need to order priorities. Only if aims are chosen *carefully* can their achievement greatly improve human welfare and happiness.

When we cannot alter events, we aim at accurate forecasts.

Unfortunately, man cannot always alter events and conditions; we must work within certain limits. In these cases, we aim instead at accurate forecasts, achievable through *careful and continuous measurement.* Weather satellites, for example, take continuous readings and report their findings regularly. Their aim is not to change weather, but to improve our ability to forecast natural, inevitable events that can bring calamity or joy to millions. At the very least, we can be suitably prepared.

THE ORIGIN OF PERFORMANCE BASED AIMS

☐ Careful specification of precise, personalized educational aims for our youth began to emerge as a significant classroom planning dimension in 1969. These aims serve the teacher and student much the way the mountain range attracts the explorer; they need to be mastered before one can go on, and they provide self-satisfying indications of progress and accomplishment. But the educational aims I'd like to explore with you now are not arbitrary. They can and should be personalized to suit the individual student, exceptional or regular, younger or older, or in any class placement.

Educational aims are not arbitary. They can and should be personalized to fit the individual student.

The data that I will share have come from many classrooms in the American Northwest. Since we are daily educational practitioners, none of us has made detailed or exhaustive studies. Yet our daily data tie together so coherently and so tightly that we want to share these findings so you too can begin to develop the detailed guidelines that are required for more careful and precise educational planning. This type and style of planning for each youngster's growth recognizes his uniqueness and guarantees his success at each educational step in the climb to personal proficiency in living a full and rewarding life.

I would like to give you a brief rundown on how we came upon the idea of setting performance based aims, and then go into a more detailed account by discussing specific curriculum guidelines.

As part of a remedial reading project she conducted, Bonnie Jean Young had youngsters practice phonetically predictable family words and monitored their progress on the daily behavior chart. Her new idea was to keep youngsters on a practice list until they reached a certain frequency of correct responses before they advanced to the next list. The method achieved some success. I remember this as one of the first suggestions that a particular point on the daily behavior chart could or ought to be used as a *decision point, an aim.*

The new idea was to keep youngsters on a practice list until they reached a certain frequency of correct responses.

At about the same time, Ann and Clay Starlin provided some interesting data on aim selection. Clay's data indicated that when correct oral reading frequencies were less than 50 per minute, emphasis on learning opportunities (such as word substitutions, mis-said letters, omissions) produced little gain in charted performance. Learning opportunities (or errors) failed to decelerate and correct performance failed to accelerate. However, if we concentrated on accelerating correct words to at least 50 per minute *before* attempting to work on decelerating learning opportunities, youngsters showed marked improvement. Once they reached the aim (of 50 per minute), they easily doubled to 100 words per minute along with a marked deceleration of errors. Here, we had stumbled on the idea that certain frequencies are important to *that* frequency's growth, and to growth in a related frequency.

Meanwhile, Ann noticed that first grade youngsters who progressed more rapidly than others said sounds from a list of letters at 40 per minute correct or above, while those below that frequency experienced considerable difficulties. A little later, Ann remarked that some youngsters took a long time to chart their own performance. And, guess what? Slow charters took longer than youngsters who could put dots on a chart rapidly in a timed practice session! We had forgotten—or should I say, we had yet to *realize*—the crucial importance of specifying *relatively high performance aims* before expecting youngsters to be competent and independent.

Specifying relatively high performance aims is crucial to student competence and independence.

CHILDREN SHOW US THE IMPORTANCE OF AIMS

☐ You have to walk before you run. The toddler has to be "sure and steady" on his feet before we feel confident in letting him go on his own. And in order to leave earth's gravity for a jaunt to the moon, velocity must exceed 300 miles per minute—or you orbit. It is clear that determining the proper aim which indicates competence is of crucial importance.

Determining which aim indicates competance is crucial.

In 1969 and into the early 1970's, data vital to the determination of aims came in from teachers experimenting in their classrooms. Jan

Running projects by the calendar produced overall drops in performance.

Skuce's youngsters, working on math facts, spent a week reviewing the one-times table, then moved on to the next. Although the students usually accelerated within each week, (that is, doing the material on one table), the overall pattern showed rapid deceleration. Running a project by the calendar produced overall drops in performance, thus *weakening* the youngsters rather than producing the intended strengthening (Figure 1). Jan changed her plan so the youngsters stayed on a multiplication table until they reached a specific, predetermined aim and they experienced consistent academic growth!

Marie Gaasholt's data (Figures 2 and 3) clearly showed that a youngster performing above 30 digits per minute in math computations easily advanced to progressively more complex math assignments. On the other hand, a youngster performing below 20 digits correct per minute steadily decelerated as he progressed to more complex assignments. (Charts of learning opportunities have been eliminated here, not because they are not important, but because we are focusing our attention on acceleration aims.)

Then came the clincher. Jim Trapp, principal of Twin Oaks School in Eugene, Oregon, and Ken Moore, who taught sixth grade there, and I were going over the data from Ken's class. We were perplexed that some of the youngsters simply could not reach what seemed to be reasonable aims in math. Learning opportunities (errors) were low, so we had no major deceleration targets. Yet several youngsters showed no acceleration. They got daily practice but failed to reach the aim of correct digits written, easily attained by many sixth graders.

Why would youngsters who know the content fail to accelerate their frequency of problems correct?

What would you have done? We were stumped. Clearly, they knew the content but were unable to accelerate their frequency of problems correct. The youngsters presented no major motivational problems, since their growth in other areas appeared satisfactory. Perhaps they were lacking a basic skill we hadn't charted. Do you have an idea? Please write in your ideas here for behaviors that you might have checked: ______________________

Let's see how your solution compared to the one (of several possibilities, of course) that we tried. One hunch was that if writing arabic digits was slow, computation performance would be retarded too. When we checked, we discovered that among these students, digits written correctly measured less than 20 per minute. This explained why they failed to reach their aims and also gave us the key to the remediation procedure. To increase the youngsters' *performance potential* in math computation, we accelerated digits written correctly, and then their math computation data accelerated! ☐

INCREASING PERFORMANCE POTENTIAL

If your suggestions above were on target, you not only are well on your way to understanding aims, but you also have a good idea of the importance of necessary, prerequisite tool skills. Fortunately,

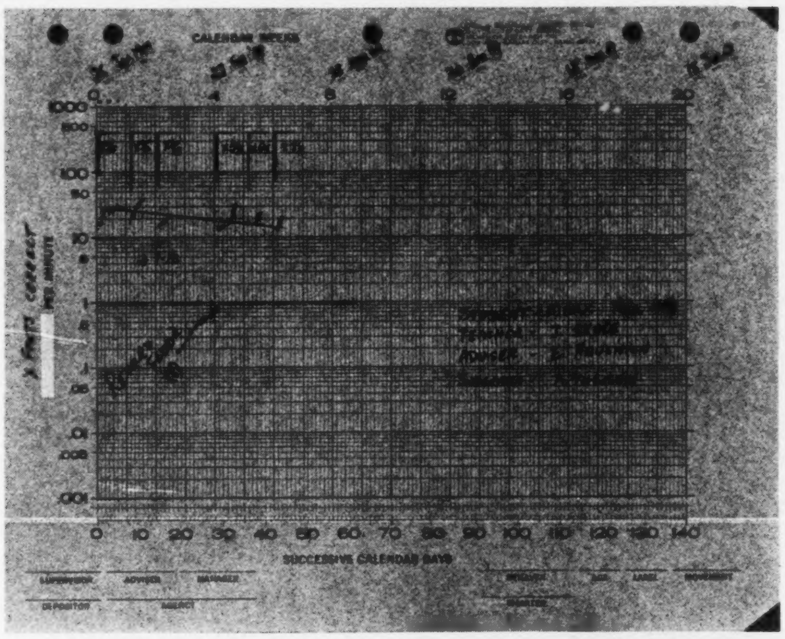


Figure 1. Teaching by the calendar produces deceleration.

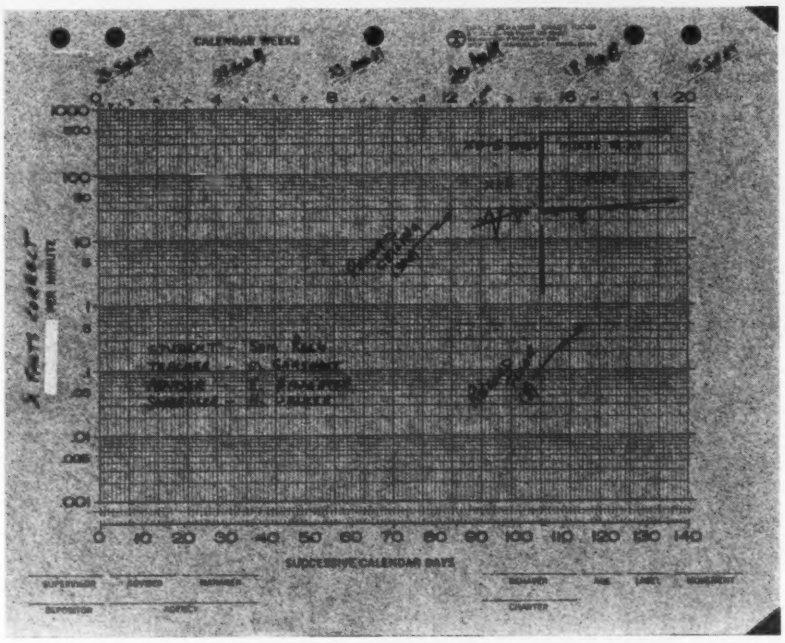


Figure 2. Sam performs 30 correct per minute and continues to accelerate through more complex curriculum.

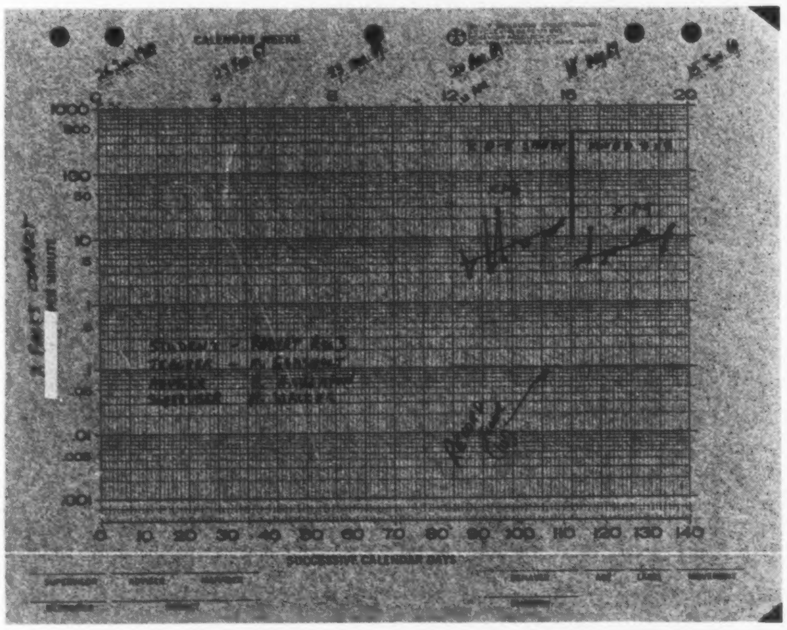


Figure 3. Robert performs below 20 correct per minute and has difficulty when curriculum becomes more complex.

The basic skills youngsters need to build on for strong academic growth must be treated with due respect.

there are not too many basic skills that youngsters need to build upon for strong academic growth. However, these skills must be treated with due respect so that we *guarantee* a youngster's proficient performance in them while (or, perhaps *before*) we develop other competencies requiring the synthesis of these skills. For example, what skill do you think is required to attain this objective: printing one's name legibly? ________________ Yes, the youngster must be able to print, and since a beginner will have to think hard about spelling his name, he should be able to print at least ______ letters per minute so he can concentrate on spelling. Yes, that's right, about 100 letters per minute.

Table I lists the basic movement cycles we rely on daily in our classrooms. Why don't you guess now, in round figures, how many digits, letters, or sounds youngsters should, and can, attain in order to cope with most of our primary curricular assignments: _____ per minute.

Table 1

make marks

. or 111 or 000

Language Arts	**Mathematics**
printing	Write numbers: 1, 2, 3, etc.
cursive	one, two, three
say alphabet	say numbers
say sounds	
say words - phonetically predictable words - phonetically unpredictable words	

We have long searched to find the crucial difference upon which success in school depends.

We have known for a long time that these skills are important, and good teachers expose their children to them regularly. Furthermore, we have always recognized that certain youngsters do better than others; their performance is more rapid and more efficient. But youngsters with poor performance have perplexed and puzzled us for years. In many ways—personality, motivation, friendliness, attitudes—they are similar to their more rapid and competent peers. For a long time we have searched to find the crucial difference upon which success in school depends—not a vague abstraction like "intelligence" but a characteristic or behavior and a technique to modify that behavior.

Differences in performance rates make the difference!

If a youngster can do the tool movement cycles at the acceptable frequency, he can handle most elementary curriculum demands.

We have recently discovered that it is often these differences in performance rates that *make* the difference. A youngster who writes 20 to 30 digits per minute when writing 1 through 10 will also be a poor performer in math computation. The primary movement cycles of letter formation (printing or cursive), number formation (digits or words), and letter names or sounds appear to be basic skills for most of our ongoing teaching. If more technological developments occur in elementary education, then finger pressing for typing or dial manipulation may become necessary skills. (Some future needed skills may already be taught to preschool youngsters "searching" the

TV set for Sesame Street!) Given that a youngster in school today can write letters and digits legibly and at an acceptable frequency, he can handle most elementary curriculum demands. If he can say his alphabet, his sounds, and a few phonetically unpredictable words, again at the acceptable frequency, he is ready to take on the first year of our schools.

BASIC FREQUENCY AIMS: READING

☐ Here is your opportunity to check your guess on basic frequency aims for tool movement cycles against some classroom data. In 1970, a group of teachers in Palo Alto, took a group of youngsters from third and fourth grades who were reading at or above 100 words per minute and went through the entire California reading curriculum. They found that if a youngster read at grade level at above 100 words per minute, he did not drop below 100 words per minute although he advanced through the curriculum. A minimum aim of 100 words per minute seems to be extremely important in oral reading.

Third graders reading 100 words per minute can handle the entire California reading curriculum.

The importance of the minimum aim of 100 words per minute is highlighted by some data collected under the supervision of Nancy Johnson (1971), who is working with youngsters in Kansas City. Her data indicate that at 50 words per minute correct or below, 90 percent of the students have relatively high learning opportunity frequencies or error rates, between 2 and 20 per minute. At between 50 and 100 words per minute, only 30 to 40 percent of the students had learning opportunities (made mistakes) in their oral reading, whereas of those students who were above 100 words per minute, only 10 percent had learning opportunity frequencies at all. This suggests an important relationship between correct frequency and learning opportunity frequency. Indeed, this relationship has been observed in other reading data, collected by Freeman and Utter, where students whose correct performances reach 100 words per minute or more have reduction to 1 or fewer learning opportunities per minute.

There is an important relationship between correct frequency and learning opporutnity frequency.

To return to our landscape analogy, if 100 words per minute is our ultimate goal or mountain, there are also significant foothills which mark important stages in a student's progress. Starlin (1970) indicates that once a youngster has reached 50 words per minute, he can achieve 100 words per minute quite easily with sufficient practice and a wise educational plan. He also found that when youngsters who were reading from 5 to 30 words correct per minute experienced severe difficulties, they usually showed evidence of not having mastered the tool reading skills, such as saying sounds, and that they may also have been having difficulty in reading either phonetically predictable or unpredictable words (Haughton, 1971). Occasionally, some of these youngsters required speech acceleration simply because they *talked* too slowly, that is below 100 words per minute.

Thus a prerequisite to effective oral reading appears to be the skill of saying sounds at an adequate frequency. We need considerably more data relating to this topic; however, the data we have seem to indicate that a relatively high say sounds rate definitely increases the acquisition of an effective oral reading frequency.

A prerequisite to effective oral reading is saying sounds at an adequate frequency.

Let me give you an example. We checked the relationship between the say sound frequency and the oral reading frequency, last year with a group of second graders, and this year with a mixed group of first through third and some fifth graders. These data indicate a strong relationship between the capability to say the sounds correctly and oral reading frequency, as high as .60 to 1.0 correlation (Figure 4). While the correlation does not indicate a causal relationship, as we have explored the data up to now, there is such a strong relationship that it seems important to have adequate and relatively high aims for saying sounds.

AIMS FOR MATH

There is almost a direct relationship between the capability to write digits and writing answers to math problems.

☐ Number reading and writing are the most important tool movement cycles in the area of math computation. In a series of classroom analyses, we found the relationship between number writing and math computation was between .90 and 1.0. In other words, there is almost a direct relationship between the capability to write digits and writing the answers to math problems. These relationships have since been confirmed repeatedly, most recently in data offered by Mike Gustin, resource teacher in Clover Park Schools, Lakeview School.

A brief comment on the definition of writing digits may be in order here. We find that the easiest way to take a sample is to ask youngsters to write their numbers, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and then to repeat the series, 1 through 10, for one minute. This simple assessment gives us basic information about the number writing

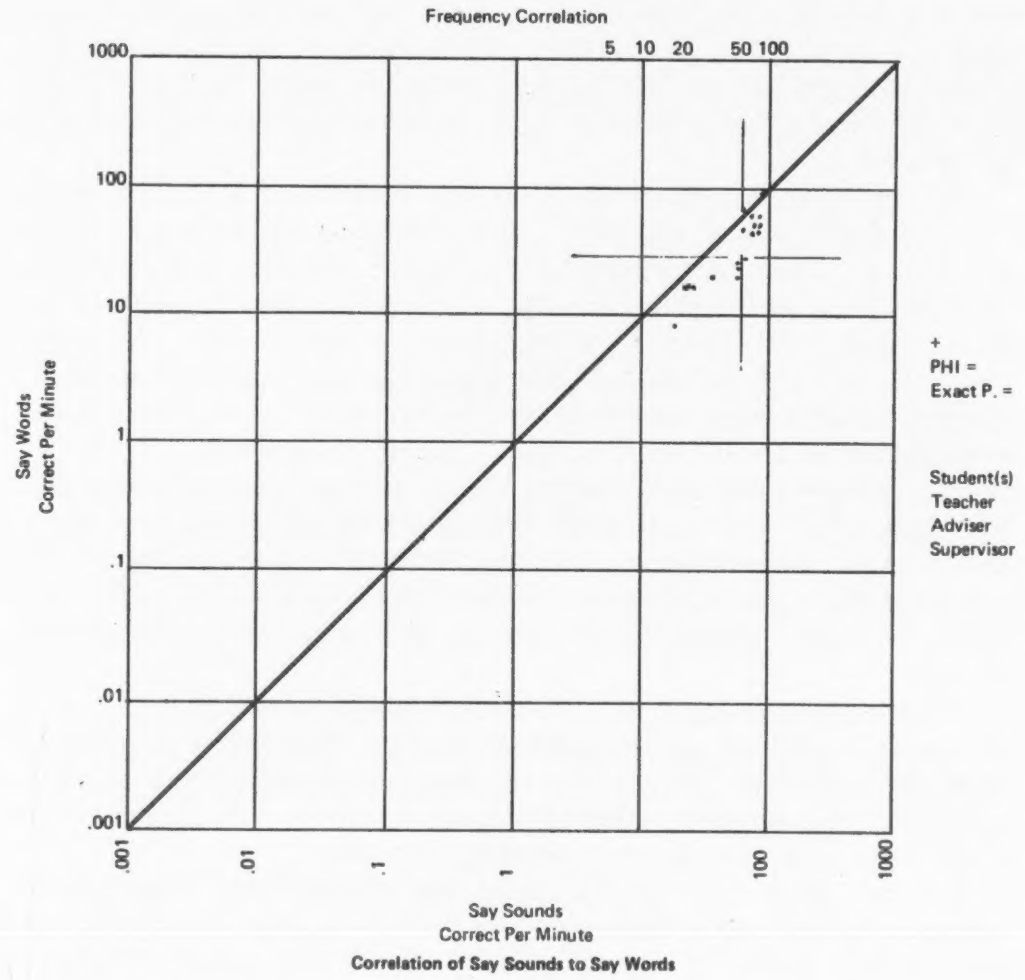


Figure 4. Correlation of Say Sounds to Say Words

capabilities of most youngsters. Another important indicator is whether or not the youngster can write numbers beyond 10. If you're concerned about this, you can have a one or two minute timing during which the youngster writes from 1 to 100. However, for a simple and rapid check, writing numbers 1 through 10 seems to be enough important information.

The data indicate that a youngster able to do his basic facts at 30 to 40 problems per minute continued to accelerate as the curriculum became more complex.

Effective skills in the basic computation requirements involved in addition, subtraction, multiplication, and division are important basic tools that can be applied in complex mathematical problems. The best information that we have to date indicates that an aim of 80 digits written correctly per minute (or 40 to 50 problems per minute) is the appropriate level for basic math computation (Gaasholt, 1970; Haughton, 1971). The data indicate that a youngster able to do his basic facts at 30 to 40 problems per minute continued to accelerate even though the curriculum became progressively more complex, for example, moving from problems such as 7 x 5 or 8 x 6 up to 856 x 221. On the other hand, a youngster whose basic skill performance was below 30 per minute showed progressive decelerating frequencies as he was advanced through his curriculum (Figures 5 and 6). Drawing on more traditional areas of review and competency definition in the area of mathematics, Tapp finds that 25 to 30 problems per minute is recognized as an important aim.

WHAT IS PROFICIENCY?

Low aims slow youngsters down!

☐ When aims are too low, youngsters are often slowed down! We find that our lower aims of 30 to 40 digits per minute have limited the growth of some children, just as changing the curriculum every week did in Jan Skuce's data (Figure 1). We first noticed that youngsters in a math group with a 40 digit per minute aim decelerated to the project aim even if they started above it. Imagine providing overall deceleration in an academic project! One student began at between 70 and 80 digits correct per minute in his addition, subtraction, and multiplication review. Over time he dropped to about 40 digits correct—simply because we did not set conditions so he could accelerate his performance to his previous level—his own potential (Figure 7). Now we are careful to insure that students reach their full potential by adjusting their aims so this deceleration pattern does not develop. Figure 8 shows how a student first decelerated to the aim and then retained and surpassed his former competence as the aims were raised.

High aims eliminate "crutches" like finger counting.

Completion of the hundred basic math facts in roughly four minutes has been an aim used in the past to indicate that the student has reached a level of fairly automatic performance in using basic skills. We now know that youngsters can still use various "crutches" at 25 and 30 digits per minute. So, recently, Mrs. Peggy May and Mrs. Beth Willis have raised basic facts aims to 80 digits per minute. Youngsters from first through fifth grades have reached this new aim and did so without finger counting or other crutches. They are truly proficient. Recently, Beth had second graders raise their aims to 100 digits per minute—and they are making it too!

Reaching this "automatic" and obviously proficient level is important in number writing and in computation to guarantee student progress through the complexities of a math curriculum without being hung up on the basic dimensions. So the pattern is the same in math as it is in reading. The important dimension that we

Figure 5. Sam does his simpler problems at 30 per minute and advances easily through curriculum.

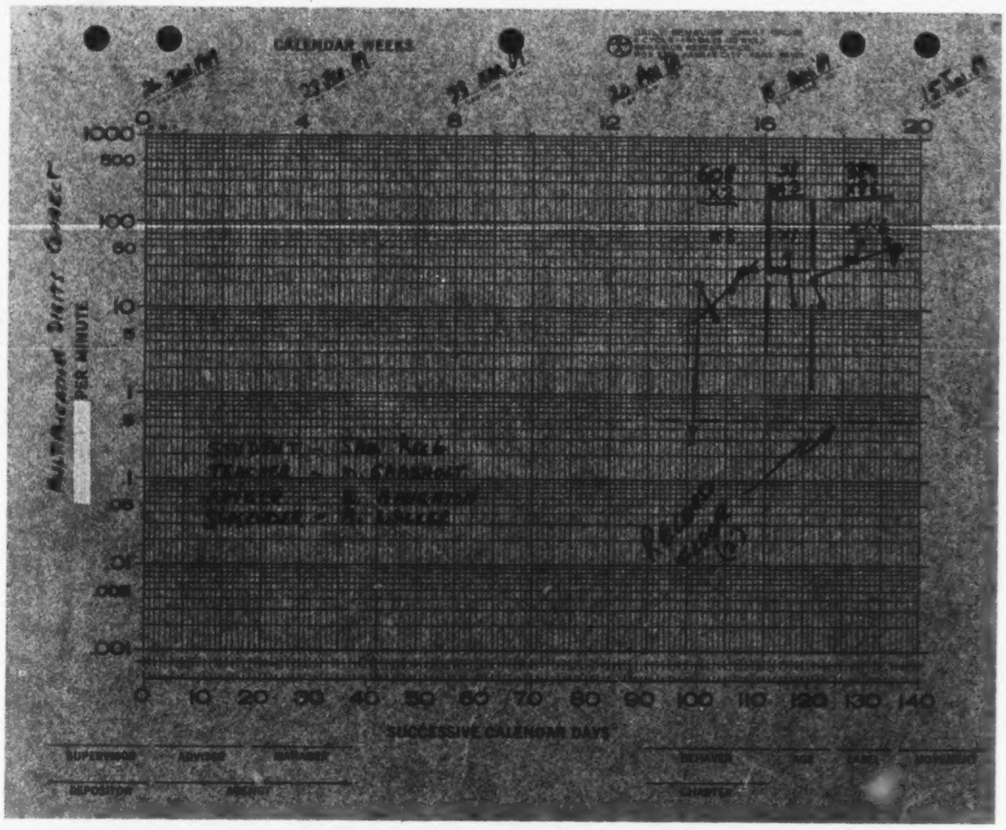
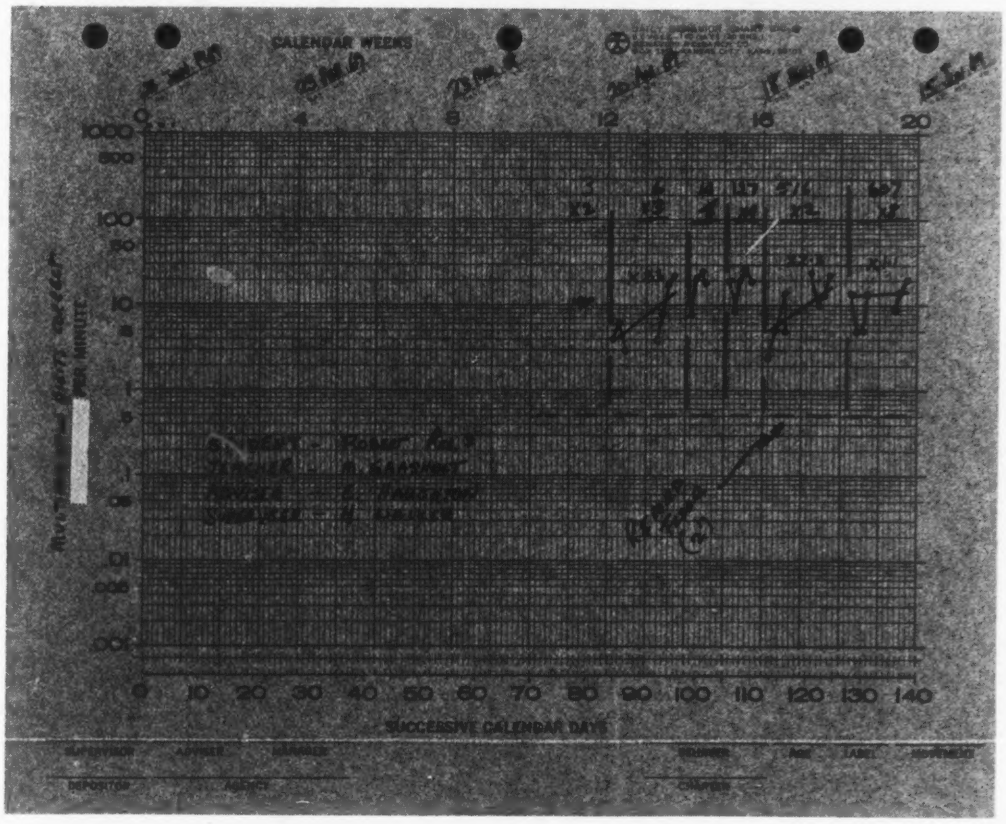


Figure 6. Robert's performance is below 30 correct per minute on simple problems and decelerates as he continues through curriculum.



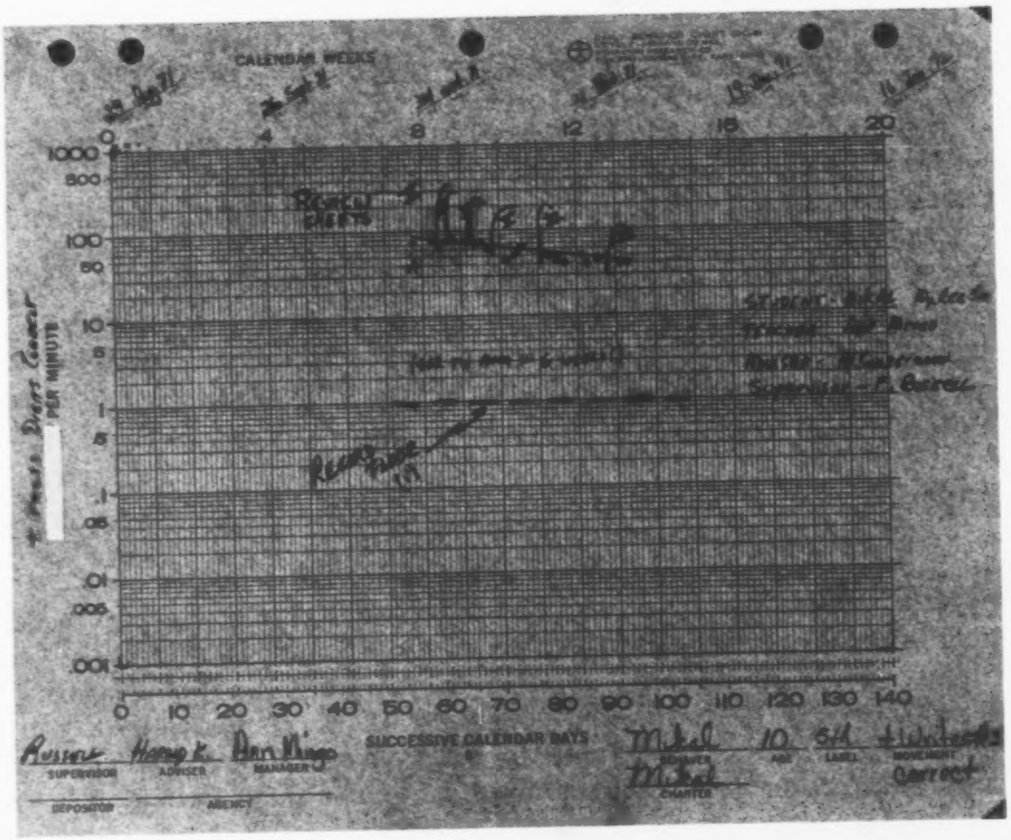


Figure 7. Mikal decelerates from his own potential to low aim.

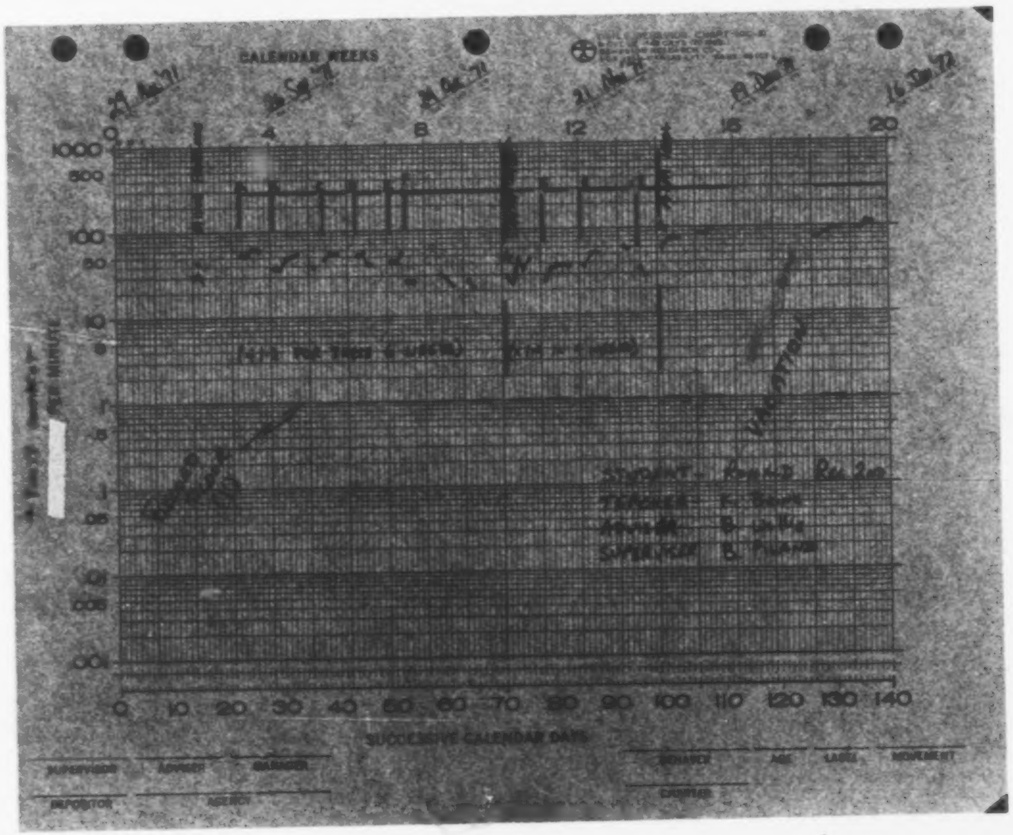


Figure 8. Ronald first decelerates to aim, then retains and surpasses his potential as aims are raised.

Aims between 100 and 200 movements per minute indicate proficient performance, whatever the curriculum area.

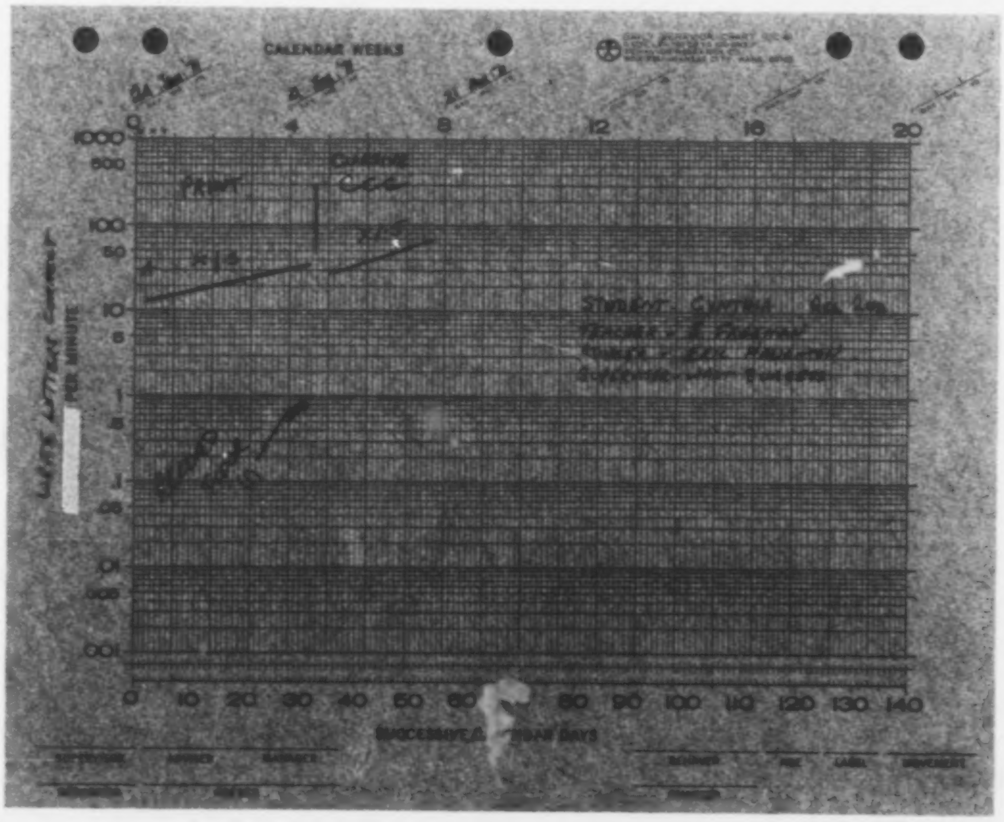
find in common is that aims between 100 and 200 movements per minute seem to be very crucial in indicating proficient performance, no matter what the curriculum area.

The relationship between frequency of letters written to the synthesis skills of writing words or sentences or paragraphs is the same as numbers written to computation skills or sounds said to words read: 100 movements per minute. Students can be locked at certain performance levels because of their letter writing performance. Obviously, if a youngster is writing 30 letters per minute in his abc's, it will be difficult for him to write much faster in any written assignment. Figures 9, 10, and 11 show that because Cynthia did not go much beyond her aim in printing letters, her cursive writing, writing letters to sounds, and creative writing were all limited.

Sometimes synthesis skills are done more rapidly than skills in isolation.

But here is an interesting point: sometimes synthesis skills are done more rapidly than skills in isolation. For example, we have data (Kunzelmann, 1970; Haughton, 1971) that children and adults write their letters faster in words than they do in a sequence of a, b, c. This suggests that youngsters may gain more from practicing writing words to accelerate letter writing than from the sequence of a, b, c, and so on. There is also some evidence (Kunzelmann, 1970) that the same relationship holds true in math computation. This finding does

Figure 9. Cynthia's low printing performance limits her cursive writing.



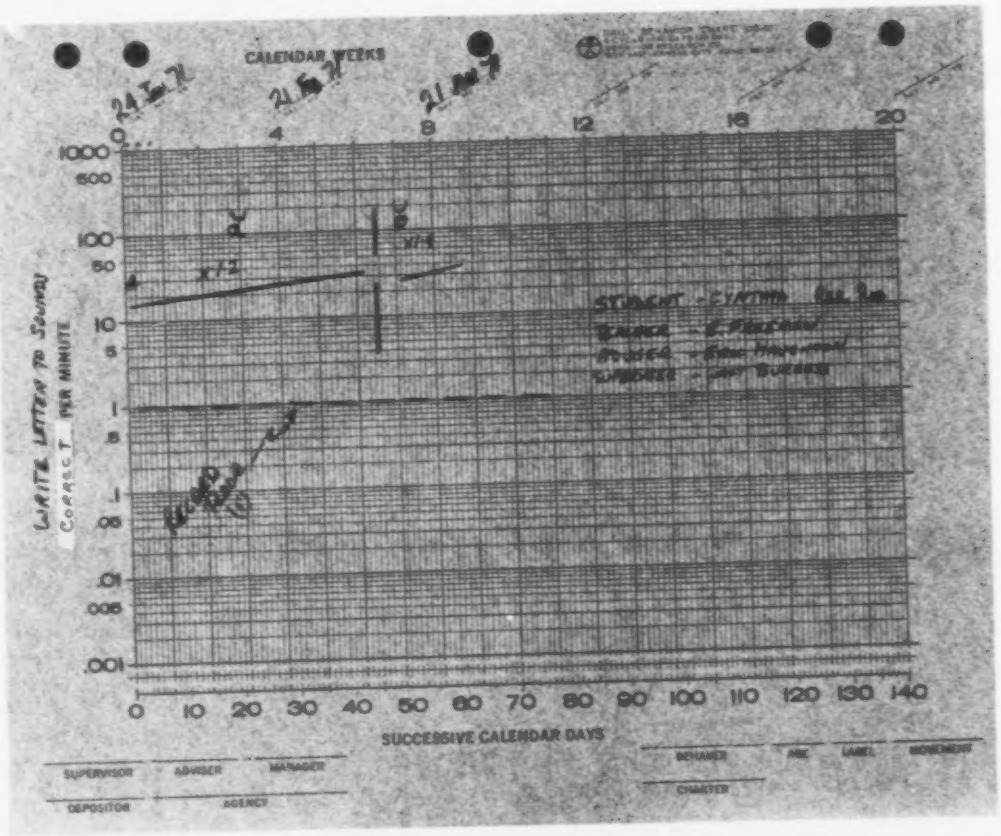


Figure 10. Cynthia's writing letters to sounds is also limited.

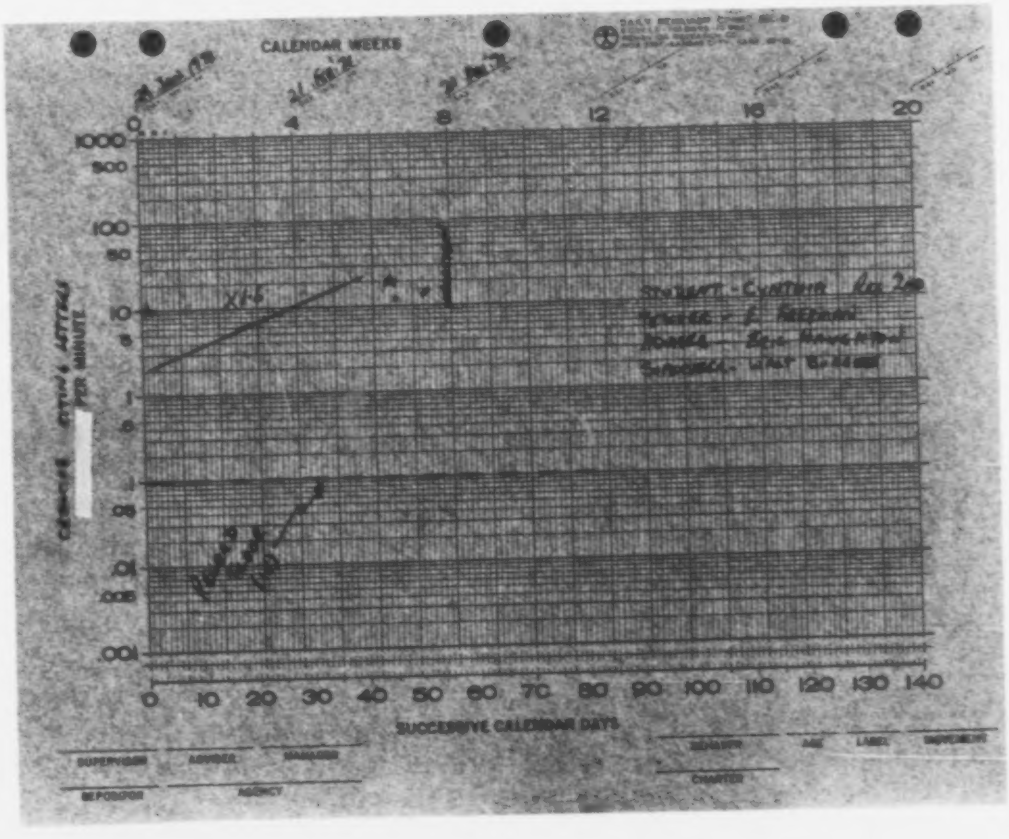


Figure 11. Cynthia's creative writing is also limited.

not detract from the importance of reaching proficiency in letter writing, and, in fact, highlights the importance of such an aim. Moreover, it suggests an alternate remediation procedure for reaching that aim.

FREE DICTATION SPELLING

☐ Free dictation spelling is a new idea introduced initially by Beverly Loeseth, a resource teacher in Eugene, Oregon. She was trying to solve the problem that we have had when spelling is paced, that is, when the words go so slowly that the youngsters are almost always waiting for the next word to come and thus not performing at their own frequency. She resolved the problem by reading either a word list at a fairly fast pace or by reading a story at a normal reading rate. Vickie Utter found that youngsters tried difficult words in stories, even though they were at primary grade levels.

Giving spelling words at usual speaking frequency allows students to perform at their own rate...

The technique is very simple. You simply choose the words, either in a list or a story, and read them at approximately your usual speaking frequency. Youngsters need to be prepared for the fact that they will not be able to keep up with all of the words that you say. One or two statements of explanation and a couple of trial timings usually take care of this adjustment. Once they get used to the fact that they cannot keep up, they write the words they hear as you read aloud through the selection. This method of giving spelling allows a youngster to perform at his own frequency throughout the entire spelling assignment. This is a breakthrough in the area of spelling where we have for years and years paced youngsters at approximately one word every 10 seconds, the usual frequency at which words are presented. Pacing not only slowed down the more able students but also prevented the collection of data on frequency and, consequently, the setting of individual frequency aims for the students.

...and allows the collection of data on frequency and the setting of individual frequency aims.

PERSONALIZING AIMS

Going too far beyond an aim increases deceleration targets instead of strengthening correct performance.

☐ Going too far beyond an aim increases deceleration targets (errors) of the performance rather than strengthening correct performance. Anyone who has tried to read orally at 300 words per minute will find that he has to slur and jumble the words together so that they are almost unintelligible. Therefore, we do not recommend excessively high frequencies as appropriate aims, because the youngster should be progressing in the curriculum rather than attempting to "break the top of the chart."

Beware of letting the aim limit students' potential.

On the other hand, beware of letting the aim produce arbitrary decisions which "chop the top off" youngsters' potential. By terminating youngsters' progress exactly where they achieve the aim (by introducing new material at that point), we fail to see how much they could achieve and let curriculum control their potential output and limit academic growth. There is no objection to giving a student a chance to exceed the aim and readjusting it to be more in line with his potential—as long as it is within reasonable performance limits and does not delay his progress *through* the curriculum.

We understand that 100 movements per minute is crucial to strong and consistent academic growth. However, this *aim should not be imposed on anyone!* For youngsters who find it difficult to attain, lower aims can be set and gradually raised until students are proficient. Also, it is not always necessary to wait until proficiency is established before advancing in the curriculum. For example, a youngster can do addition problems with sums up to 9 (e.g., 1 + 2, 4 + 1) before his number writing has reached 100 digits per minute. In fact, we do not know *exactly* where it is best for a given youngster to begin with synthesis skills, but it is probably when the basic skill reaches 30 to 40 digits per minute. Similarly, a youngster can begin to say words before his say sound project reaches 100 per minute. Future data will help refine these project decisions. A manager (teacher) should watch correct and error data carefully when a new project is introduced. If the synthesis (computation, oral reading, story writing) is difficult for a youngster, the celeration line will be quite flat, and the basic skill celeration line may decelerate. At this point, we do not have sufficient data to offer guidelines. We will appreciate data from any of you on this topic so that guidelines can be established.

Lower aims can be set and gradually raised until students are proficient.

OUR GOAL: THE WELL ROUNDED STUDENT

☐ Surely we share the same kinds of goals people have always had for their children—a well rounded, knowledgeable student. But how is this result to be achieved? Aims are the precise and specific objectives of an overall objective or goal. For example, if the goal is reading proficiency, the aims involved will be stated in the form of a frequency—100 words per minute correct with 2 or fewer errors or learning opportunities per minute. Stated in this way, aims can be shared with the youngster; he can know what he is striving for and how well he is progressing. Initially he can even work for a lower aim while he builds his proficiency and then raise his aim as he progresses in the skill. He becomes the explorer, setting his sights on ever more difficult or higher mountains, but he can adjust the landscape to suit his needs.

Aims are the precise and specific objectives of an overall goal.

Stating aims as frequencies allows youngsters to share in their educational planning.

Let's see how our traditional practices have stacked up against our objective: the well educated student. We often do certain lessons or exercises for a set number of days or weeks and then move on. Does such a calendar plan guarantee a youngster's acquisiton of a skill? Of course not. We all know and feel very uncomfortable about the fact that some youngsters are left behind. We respond to the pressure of time and not the proficiency of the student.

Traditional proficiency measures which neglect the crucial element of time are insufficient.

Another method is to assign certain pages to each youngster. Often this approach increases the amount of individualization, and yet, is this satisfactory? Most workbooks "review" or "expose" youngsters to ideas and concepts. There may be three or four concepts on a single page. Workbooks do not systematically strengthen a skill, guarantee the youngster knows it solidly, and then move on. We know that carefully graduated, repeated practice with feedback on refinement of the skill is needed to thoroughly develop or strengthen a skill. Obviously, the page by page assignment will not help a majority of youngsters to reach proficiency.

More recently, we have been paying more attention to specifying *what is to be learned* rather than *what is to be taught*—that is, concentrating on the child's behavior rather than the teacher's. We carefully measure changes in a youngster's behavior that indicate learning and state a goal: be able to write digits 1 through 10 or to write correct answers for addition combinations 0 to 9. However, even this method does not stress actual learning strongly enough; these objectives fail to include the crucial dimension of *time.*

Time, in any precise sense, is a very recent discovery. Timing events in a meaningful way is so new that we talk of running a four-minute mile rather than saying 15 miles per hour or the 100 yard dash in about 10 seconds instead of 25 miles per hour. When we convert to the common base of miles per hour, it is apparent that the 100 yard dash is run 16 times faster than the mile, although this is not obvious when different standards are used to report similar running events. Before accurate timing on a common base, we knew only who won each race in a track meet, not who ran the fastest.

Teachers, the daily practitioners of pupil growth, must pay strict attention to time.

Of course, sports skills have always been timed for instructional purposes; the hallmark of the coach is the stopwatch. It is recognized that growth in these skills requires careful, daily recording or coaching may be ineffective. We teachers are just beginning to recognize that *we,* the daily practitioners of pupil growth, must pay strict attention to time also. Time is a fundamental component of measuring processes that change, and since kids are almost constantly changing, we must include time in our records of their performance. In so doing, we create settings which virtually guarantee growth. These learning settings incorporate three great teaching strengths: (a) precise, detailed knowledge of the facts of the youngster's growth; (b) our finest intuitive powers; (c) through the added bonus of precise data, the capability to make accurate forecasts of each pupil's performance. Teaching in these settings is marked by students working at their own levels and compassionate guidance for youngsters who want to reach precise performance objectives.

SHARE IN CAREFULLY DOCUMENTED GROWTH

When youngsters become involved in reaching performance aims, they become our allies... personally reliant learners.

☐ We invite you to share the excitement and joy of carefully documented growth. When youngsters become involved in reaching performance aims, they become our greatest allies in attaining these shared goals. Also, charted data with precisely stated aims allow us to forecast the outcome, related to the current growth pattern. This sets the stage for maximum youngster independence and personal management. And the personally reliant learner is one of our most fundamental educational goals.

Our efforts with the youngsters we've worked with to date indicate that they grow in many facets—many we currently do not record but that are obvious to visitors to fully committed precision teaching classrooms. Last year, a pediatrician visiting one of these classrooms exclaimed, "Why these children are *all* kings and queens!" It did appear to be true of these 7 year olds, then in grade two and who had been practicing precision teaching for only 30 weeks.

WHAT TEACHERS NEED TO LEARN

☐ Youngsters acting like kings and queens is not very well pinpointed, but somehow highly complimentary. These children carefully watched and then began to direct their own daily growth. They prepared for each of their assignments, corrected and charted them rapidly, and offered help to their table mates. When adult visitors inquired about precision teaching, these second graders could also explain each project in detail, describing the various curriculum changes, their aims and celeration lines. These are the very skills that we teachers need to master during *our* training.

The skills these second graders showed are the very ones teachers need to master.

Therefore, teacher training must now include courses in the practical use of recording and charting. Briefly, our preparation needs to teach us how to:

Teacher training should be practical...include recording and charting.

1. Pinpoint and sequence relevant academic and social movement cycles,
2. Understand and conduct the basic steps of direct daily recording and charting,
3. Instruct youngsters in charting daily on the standardized behavior chart,
4. Help youngsters interpret their data correctly,
5. Do simple celeration analysis of growth.

These skills are easy to teach and easy to learn. As youngsters begin to understand their own progress, our responsibility as teachers shifts from the day to day management of students to the exciting interaction with youngsters knowledgeable and enthusiastic about their daily growth.

More complex than counting and charting is the setting of aims which really strengthen youngsters' skills. Ultimately, we want youngsters to know how to set their own aims, forecast accurately regarding their long-term goals, and reset their aims to assure their progress. At this time, we as teachers must at least be able to:

Both teachers and students should know how to set aims.

1. Locate proficiency levels for aims,
2. Personalize temporary goals which lead to the proficiency level aim,
3. Plan so youngsters can and do achieve aims,
4. Increase youngsters' growth potential by raising their performance on simple movements.

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Thus, we still face the major classroom problem of adapting available curricula to meet the needs of individual youngsters; we must make sure students have a *chance* to learn the skills and concepts presented to them.

The challenge to the teacher preparation institutions, professional associations, teachers, parents, and youngsters is enormous. But working together, employing precise recording and charting as a tool in a humane atmosphere, we can make it. By setting appropriate aims and helping youngsters grow in understanding themselves and planning their own growth, we surely can make it.

The challenge is enormous...but working together we can make it.

Gaasholt, M. Precision techniques in the management of teacher and child behavior. *Exceptional Children,* 1970, **37**, 129-135.

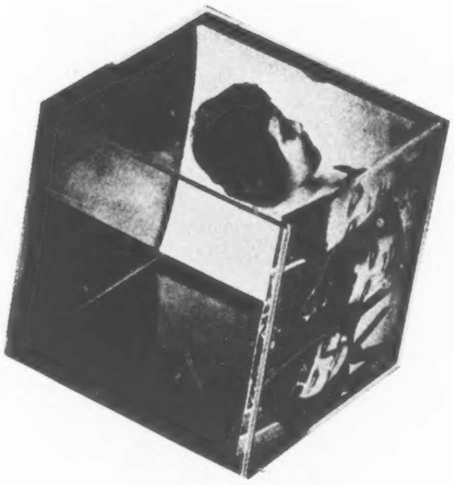
Haughton, E. Correlation of Say Sounds to Say Words. *Behaviorgrams,* Jan. 21, 1971, Article 061.

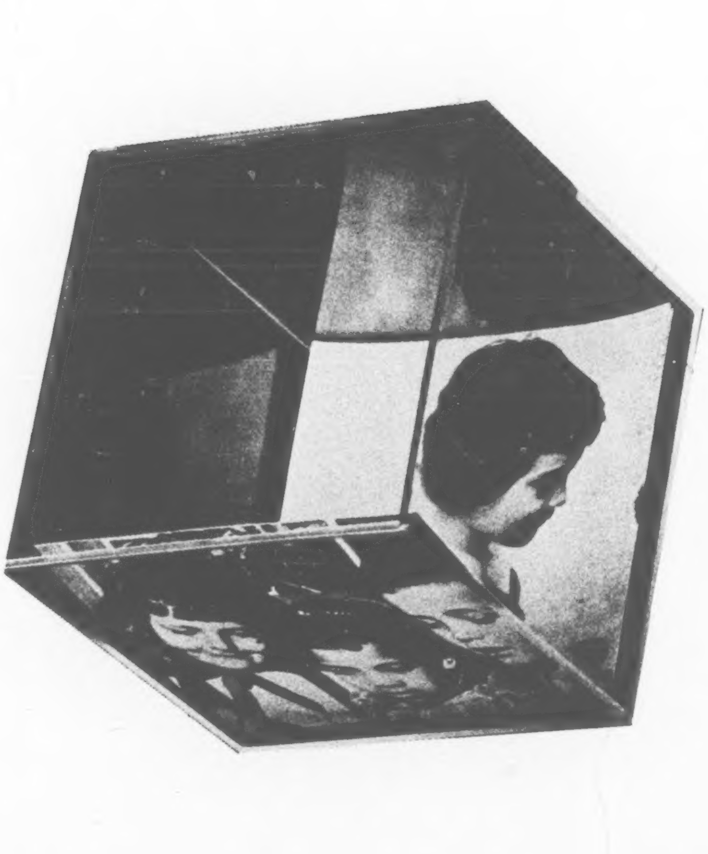
Johnson, N. Data published in Behavior Bank, P.O. Box 3351, Kansas City, Kansas, 1971.

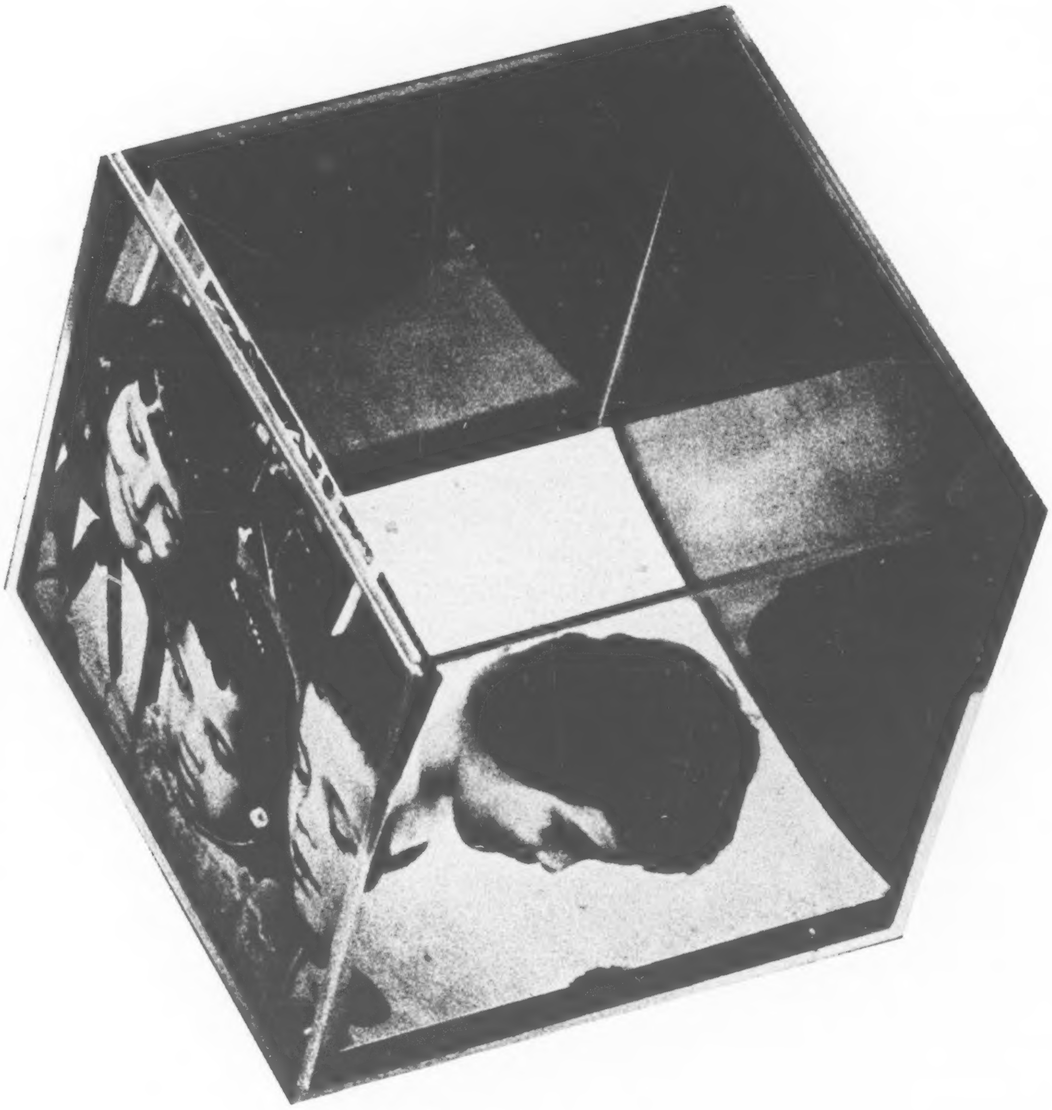
Kunzelmann, H. (Ed.) *Precision teaching: An initial training sequence.* Seattle: Special Child Publications, 1970.

Starlin, C. Evaluating progress in reading. In B. Batemen (Ed.), *Learning Disorders IV.* Seattle: Special Child Publications, 1970.

Thomas S. Johnson presented a review of behavior modification as it applies to speech therapy. His own research and that of others in the field indicate that behavior modification techniques are effective and efficient in monitoring the progress and modifying the speech, language, or vocal behavior of speech impaired children.







Precision Therapy Is the Way to Go

THOMAS S. JOHNSON

SPEECH THERAPY IS BEHAVIOR MODIFICATION

☐ The application of behavior modification to the work of the speech clinician has received much emphasis recently, particularly at professional conventions, short courses, and workshops on local, state, and national levels. In addition, there is beginning to be a significant body of behavior modification literature which relates directly to the area of communicative disorders.

The new behavior modification technology can greatly increase efficiency in modifying speech and language behavior.

It is apparent that a considerable portion of the work which speech clinicians have always done can be viewed as attempts to bring about appropriate and desirable changes in the speech, language, and vocal behavior of children and adults. Thus, in a sense, all speech clinicians are behavior modifiers, that is, specialists in the modification of speech, language, and vocal behavior. The technology offered by behavior modification has the potential for greatly increasing the efficiency of the things speech clinicians do in the modification and management of these communication parameters. The technology will not supplant the present role of the clinician, but instead will support and strengthen his clinical competency.

The efficacy of applying behavior modification to speech, language, and vocal behavior has been adequately demonstrated in experimental research and clinical application by many individuals. The task which we now need to consider is one of training clinicians to use these procedures as clinical tools.

The single most important ingredient of precision speech therapy is measurement.

The single most important aspect of this utilization is measurement, that is, finding ways to accurately and reliably measure the speech, language, or vocal behaviors which may need correction. Traditionally, speech clinicians have not used precise, continuous monitoring systems in conjunction with their therapy. More typically, they have relied on pre- and posttesting with "standardized" tests or upon their own subjective impressions as means for describing client progress. Clinicians have not been trained to use continuous, monitoring measurement systems with their clinical work.

MEASUREMENT IN ARTICULATION THERAPY

☐ The behavior modification technology has stimulated an effort by many investigators to seek more efficient and effective ways to measure speech, language, and vocal behavior. The initial efforts in this regard were focused primarily on articulation disorders because of the overt nature of articulatory responses. Mowrer (1969a & b) has described the efficiency of calculating rates of correct and incorrect sound production of a target sound and plotting the rates on a semilogarithmic chart. This technique allows one to monitor the increased efficiency of the target sound being produced during a variety of therapy tasks or stages. Diedrich's (1971a & b) recent data indicate that this measure of correctness of articulation responses is the most relevant and sensitive articulatory measure. Figure I shows an example of such data plotted on the semilogarithmic chart developed by Lindsley. As you can see, various therapy program stages may be indicated on the chart. The first stage in this example

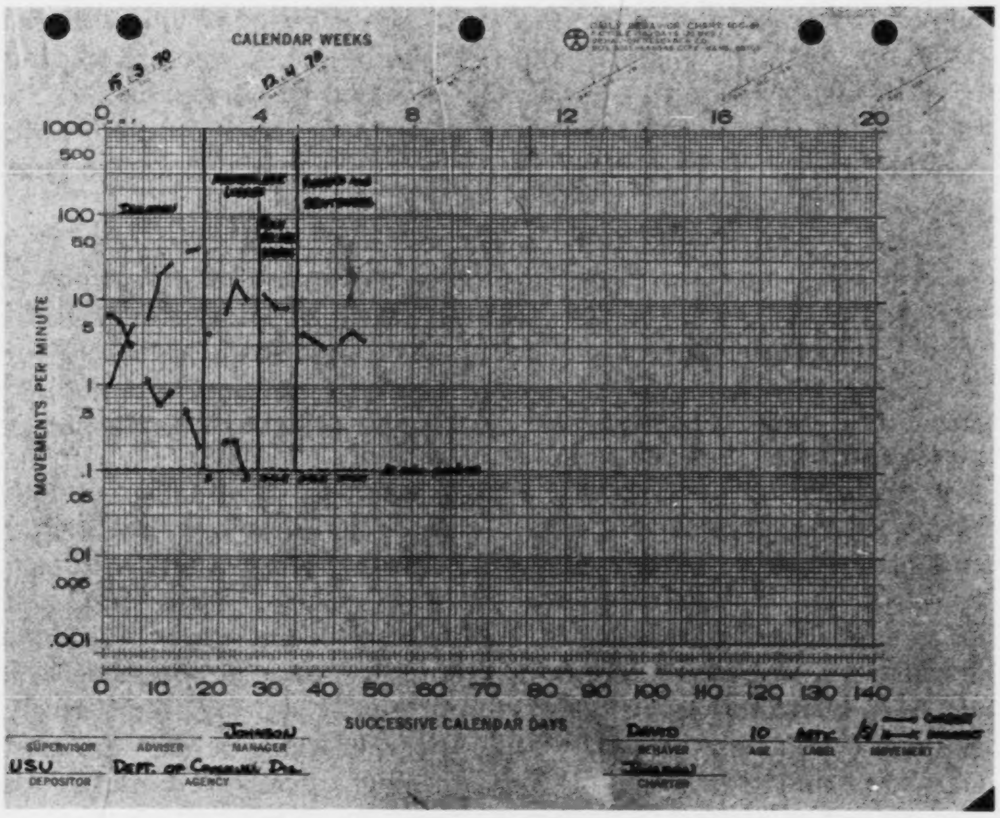


Figure 1. Charting Correct and Incorrect Phonemes

is the target sound being produced in isolation. The program was then shifted to the production of monosyllabic words, polysyllabic words, phrases, sentences, and finally conversation. During all of these stages the correct and incorrect rates were calculated and charted, and the resultant data show a desirable acceleration of correct responses and deceleration of incorrect responses.

This is a very basic form of data collection, but is something that very few speech clinicians have done on a regular basis. This type of data also provides the clinician with information regarding the child's overall rate of responding. These data seem to be necessary in light of the discussions by several investigators that clinicians spend too much time talking in therapy sessions and not enough time evoking and listening to the speech responses of the child. In therapy, the child should do the talking, not the clinician. Mowrer (1969b) has reported some revealing data in this regard as has Coomes (1967).

In therapy, the child should do the talking, not the clinician.

Diedrich (1971a & b) at the University of Kansas has investigated a procedure based on public school research during the past two years. His data indicate that a correct/wrong count in a 3 minute sample of conversational talk is sensitive to minimal changes in articulation and can be conducted in public school speech and hearing programs where children are seen in large numbers. His procedure is simply to record the number of correct and incorrect target pho-

Conversational talk provides data for articulation therapy progress charts.

nemes within a 3 minute sample of conversational talk with the child. In addition, this procedure can be taught to parents or other clinical aides outside of the therapy situation and gives the clinician information with regard to generalization (carryover). Diedrich's procedure appears to be a very good one for clinicians to use to chart articulatory progress.

Three minutes is a small price to pay for precise measurement of progress and compilation of good data.

The big complaint from speech clinicians has been that they haven't had time to continuously measure progress and to administer frequent tests during therapy because they may see a given child for only 15 minutes once or twice a week. The Diedrich procedure seems to answer this complaint because it can be handled in a minimal amount of time. Three minutes is a small price to pay for precise measurement of progress and compilation of good data.

Another procedure which has been found to be effective in monitoring the progress of articulation cases is that developed by Shelton and his associates (Elbert, Shelton, & Arndt, 1967; Shelton, Elbert, & Arndt, 1967; Wright, Shelton, & Arndt, 1969). These sound production tasks are a series of 30 items for each phoneme in different articulatory contexts: isolation, nonsense syllables, monosyllabic words, polysyllabic words, phrases, and sentences. The items are given to the child imitatively, that is, the child repeats what the clinician says, and the clinician judges whether or not the target sound was correct or incorrect. This procedure also requires a very minimal time investment yet provides a sensitive index of articulatory progress on an imitative level. Each of these procedures allows the clinician to look at the effects of his therapy in a more precise way.

Measurement techniques give more information to the speech clinician than he's ever had.

These measurement techniques give a great deal more information to the speech clinician than he has previously had at his disposal. Typically, what has happened in speech therapy is that before therapy begins, the clinician has given an articulation test in which he tested all the sounds, usually in initial, medial, and final positions in words, and made a judgment as to whether the sound was correct or whether it was a substitution, distortion, or an omission error. It was very likely to see, for example, in October that the /s/ sound was incorrect in all three positions in the words tested. Therapy would then have been instituted and continued until January or later before the child was retested. And the clinician may well have found that although three months had passed in giving therapy on the /s/ sound, it was still incorrect in all three positions as measured by this testing means. With a continuous, monitoring measurement system, however, one may see a good acceleration of correct /s/ production, a deceleration of incorrect /s/ production, and the necessity for a continuation of the therapy program. It also says to the clinician that his therapy has not been a failure, but has moved the client towards the final terminal goal of correct /s/ production. "He's not there yet, but he's on his way."

Speech therapy has been imprecise. . .now you can measure phonemes in articulation.

Articulation therapy can be measured with whatever procedure or graphing system a clinician may want to use. Speech therapy has been so imprecise for so long that until very recently I was preaching "just count it!" because clinicians haven't even been doing that. It is a very basic thing, yet I think very important that clinicians be developing and utilizing more precise measurement tools. The major point I want to make is that *you can measure correct and incorrect target phonemes in articulation therapy.*

MEASUREMENT IN STUTTERING THERAPY

☐ For years speech people have worried about the kinds of dysfluencies (sound repetitions, word repetitions, prolongations, injections, etc.) that stutterers have. I have become convinced that we need not be concerned with the type of dysfluency as long as the stuttered word may be recognized as such. Ryan (1970) designates "stuttered word" as a pinpoint and has found in his research that this is the most functional unit of behavior to count and chart during the course of stuttering therapy. Again, these basic measurement data are rate data, that is, stuttered words per minute, and may be charted efficiently on a semilogarithmic graph. This behavioral pinpoint may be used irrespective of the type of therapy program which is being run, and the importance of its use lies in the fact that a continuous monitoring system is being used and procedures are adjusted according to the changes in the client's measured stuttering behaviors (stuttered words). Thus, if the rate of stuttered words is not decelerating, something needs to be adjusted in the therapy program which is being run on the client.

Counting stuttered words gives all the data needed for measuring progress in therapy.

Figure 2 shows an example of the use of the "stuttered word" pinpoint in our clinic. The therapy program used in this example was an adaptation from Ryan's fluency program (Ryan, 1970). This client's stuttered words decelerated to essentially zero over the course of this therapy period.

The clinician may validate his therapy procedures with precise and continuing monitoring.

Again, the major point is that a clinician may validate his therapy procedures with precise and continuous monitoring measurement data. Whether one is using an operant conditioning program, a psychoanalytic therapy, or something in between, the addition of a measurement technique will make what the clinician does accountable and more efficient.

MEASUREMENT IN VOICE THERAPY

☐ An area in communicative disorders that has been highly imprecise and frustrating to many clinicians is voice therapy. Again, I feel the key is in the objective measurement of vocal behavior, and some progress is being made towards this goal. The most common voice problem confronted by the school clinician is vocal nodules. Vocal nodules are small swellings on the vocal cords of the larynx which usually are the result of vocal abuse behaviors. In children, these abuse behaviors usually consist of screaming, yelling, and/or loud talking. These behaviors are environmentally specific, that is, they occur in certain high probability situations and are controlled by the presence of environmental consequences.

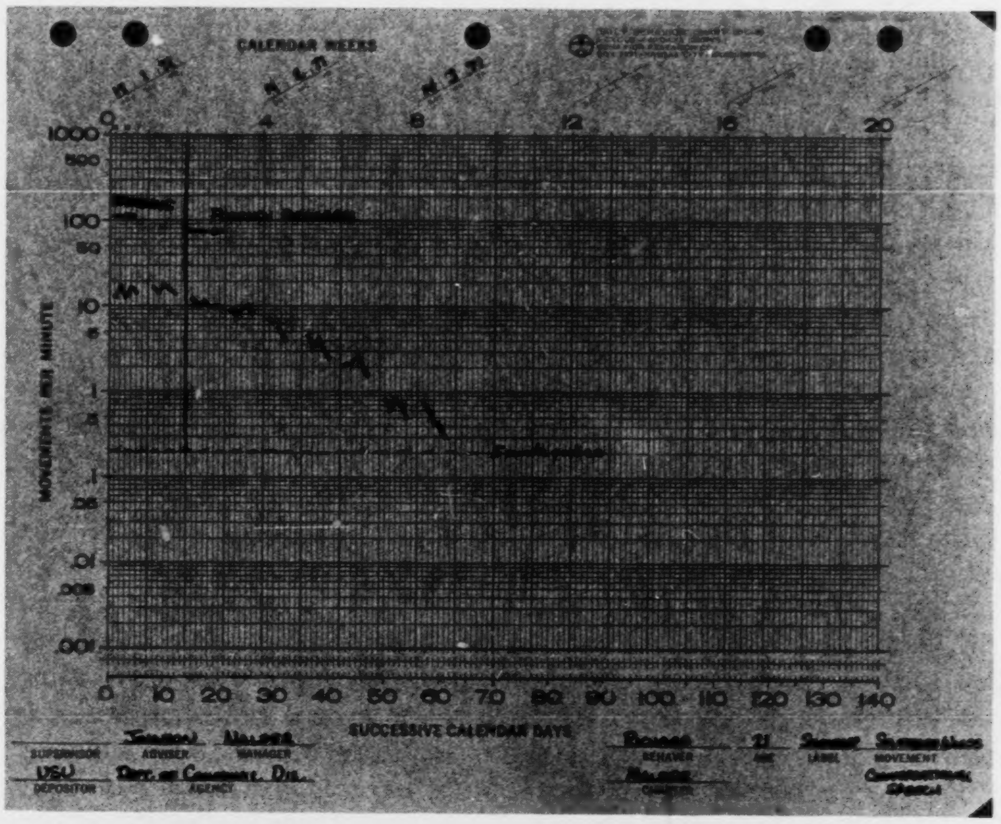


Figure 2. Charting Stuttered Words

Yelling and loud talks are environmentally controlled.

Traditionally, speech therapy for these problems has focused on changing breathing patterns, modifying vocal attack, or retraining to overcome poor vocal habits. Few clinicians have been able to systematically manipulate the environment outside of the clinical session, and consequently voice problems have attained a reputation for being resistant to therapeutic change.

During the past two years we have been developing a program designed to systematically eliminate vocal abuse behaviors through a self-recording and charting procedure which deals with specific environmental settings. Our success with this effort has led us to conclude that voice therapy for treating children's vocal nodules should emphasize behavioral control of the environment rather than vocal retraining procedures. We have had success in the elimination of vocal abuse behaviors, and consequently the vocal nodules disappeared.

Voice therapy with children's vocal nodules should emphasize behavioral control of the environment.

Our procedure is to initially pinpoint the specific types of vocal abuse behaviors which the individual child has in various environmental situations. The most common pinpoints are loud talks and yells; however, there is a range of possibilities from crying to making car motor noises on a bicycle. Next, we spend a considerable amount of time teaching the child what we mean by the pinpointed behavior.

This is necessary to assure that he counts the appropriate behavior. Once this is done, we give him a wrist counter and have him begin to count the pinpointed behavior at a period of time which he has selected and which is a high probability time. During the school year, for example, a highly functional, high probability time for loud talks or yells to occur is during the recess period. The child is instructed to wear his counter only during that time, and each time he loud talks or yells he clicks his counter. At the end of the period, he is asked to record his data on a behavior chart and wait for the next specified time to count.

Thus, our goal is to get the vocal abuse behaviors under control in one situation and then successively add other high probability situations to it. For example, once the behavior is under control at recess time, the counting may be extended to include lunch time, gym class, and so on. This progression is critical, because kids will quit counting after a week or two if instructed simply to count all day. The successive situation approach maintains the counting over a longer span of time. Once we have the vocal abuse behaviors decelerating and under behavioral control in all the high probability situations (including extraschool activities), our experience has shown a gradual reduction in the size of the vocal nodules as reported by the physician in charge of the case.

Vocal nodules gradually disappear.

Figure 3 shows a chart of vocal abuse behavior and the progression from situation to situation. The data show the vocal abuse behaviors starting at a high behavioral rate and gradually decelerating. The interesting thing about these data is that we are not really concerned about the behavioral data as much as about what the physician says about the state of the nodules at periodic intervals. We have had experience in seeing "moderately large bilateral nodules" completely eliminated in eight weeks. We have data now on about 10 successful cases who have been run on the program.

The symptoms of spastic dysphonia can be measured and eliminated.

A continuous monitoring measurement system can also be applied to spastic dysphonia. This disorder is characterized by pitch breaks, laryngeal spasms, choked strained voice production, and extraneous facial movement. Some authors have referred to it as "laryngeal stuttering" as it reminds one of regular stuttering; however, the symptoms are focused more at the level of the larynx. Most authorities have agreed that spastic dysphonia is either the result of a severe psychoneurosis or else reflects some central nervous system dysfunction, and thus they have concluded that the prognosis for improvement is poor. Pitch breaks, laryngeal spasms, and the other behaviors which accompany this disorder are overt and observable behaviors, and there is a high degree of reliability among judges in identifying them. A masters thesis completed at Utah State University (Beste, 1971) investigated the effects of response contingent shock adminis-

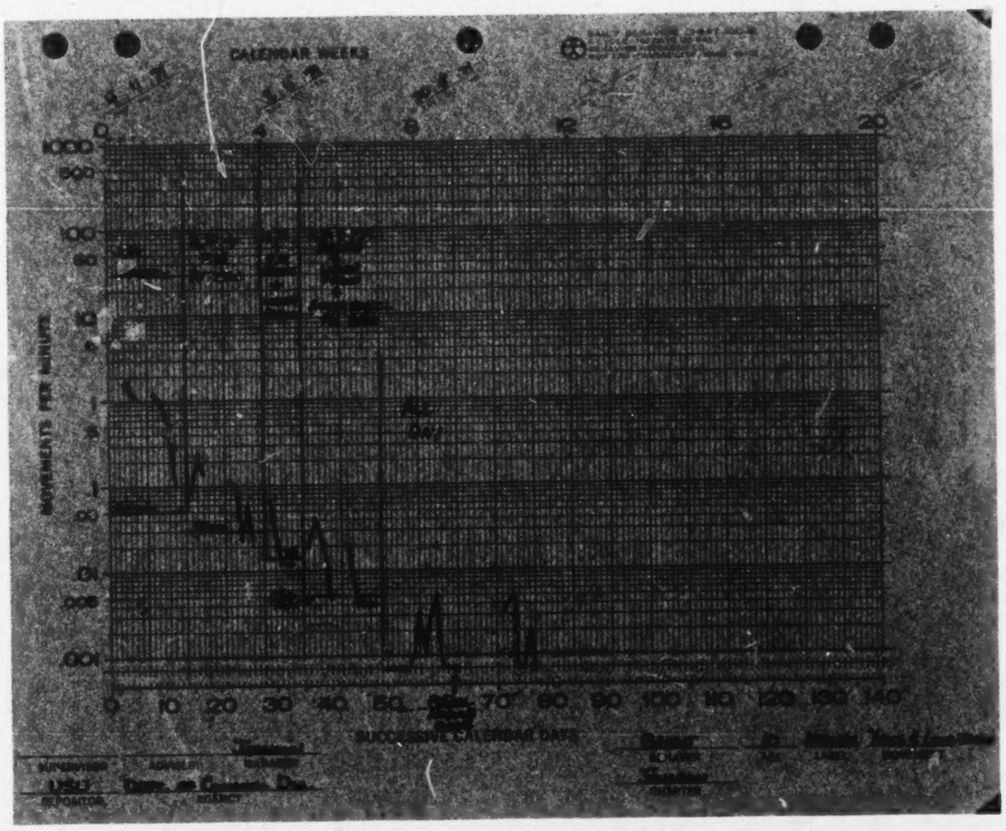


Figure 3. Charting Vocal Abuse Behavior

Whether or not spastic dysphonia is a psychoneurosis or a central nervous system problem is less important than the fact that the behaviors can be changed.

tered contingent upon pitch breaks and laryngeal spasms in a spastic dysphonic subject. In that study, we were able to demonstrate that those pinpointed behaviors were controllable by consequence manipulation, and we were able to decelerate them to zero for a time during the study. The results indicated that these behaviors as a response class are in fact manipulable when appropriate consequences and/or stimulus conditions are arranged. Whether or not the disorder is a psychoneurosis or a central nervous system problem seems to be less important than the fact that the behaviors can be modified and changed.

I think something should also be said about some exciting things which are happening in other areas of voice measurement. Several groups of researchers are developing electronic measuring monitoring devices which, when fully developed and tested, will give us some important tools of measurement in the area of voice. Basically, I see the use of these as feedback—continuous monitoring devices which have the potential to act in the same manner as the other measurement procedures which I have described. In other words, they can make the clinician more accountable and efficient.

PRECISION SPEECH THERAPY IS FUNCTIONAL

☐ Let me conclude by saying *precision therapy is the way to go and measurement is the big thing.* I don't see anything that faces us in communicative disorders that cannot be measured, given the pinpoint technology. Language is still the most underdeveloped area as far as remediation programs are concerned. I think the basic reason is that we haven't had specified language units which we could deal with in any systematic way. There are some people doing some exciting things in the area of pinpointing functional language units which I feel will give us a major breakthrough in this area. Lee (1966) has developed a system which I feel is a real step forward in the specification of language units which can be managed systematically. In addition, Gray and his associates at the Monterey Institute for Speech and Hearing have developed a series of "Language Programs" which appear to be very promising.

Given the technology, anything that faces us in speech therapy can be measured precisely.

Language is the big problem now. In the other areas I feel we have some well developed measurement skills. We have the efficient tools in articulation developed, we have come a long way in the area of stuttering, and we are making great strides in the area of voice. With precision measurement and with the new technology of behavior modification, we can efficiently modify speech and language behavior in appropriate directions.

QUESTION—As I have looked at speech therapists' data, there seems to be a tremendous amount of "locking," that is use of the therapist's rate rather than the child's. For example, you control the rate while dispensing cards or giving sounds to be imitated. Is this routine speech therapy operation? Is it intentional? It seems that so much of the locking we do, with materials as well as with the therapist, limits the whole idea of the kid being free to respond.

JOHNSON—A lot of work is being done to try to get clincians to limit the amount of talking and instruction they give and to allow the kid to make more responses in the session. It has been only very recently that we've paid much attention to increasing the rate of response or the consequences which follow the responses. Much of what we do is also highly dependent upon auditory modeling of the correct speech or language unit, and therefore, the clinician's rate is very much a part of the kid's rate.

JOHNSON—The trick is to make these models and cues as efficient as possible. I see a change coming in the profession; people are now paying more attention to being more precise in how they program stimuli. I'm not as much concerned with the kid being entirely free to respond as I am that efficient stimuli are used to evoke behavior in the desired direction.

QUESTION—Do you encourage the speech correctionist to count as correct those sounds that are close to the target response or is that assumed? So far, it seems like all or nothing.

JOHNSON—We use a moving or sliding criterion. You have to define as you move through your therapy program what you are going to accept as correct and incorrect. Incidently, speech people as a rule, as incredible as it seems, are very poorly trained in evaluating child responses, particularly in auditory discrimination. I would like to encourage CEC or someone to develop a series of training tapes for speech clinicians to teach such response discrimination more effectively.

QUESTION—Shouldn't these methods cover the area of "sliced movement cycles"? In other words, it might be that putting my teeth together at a rate of 45 per minute might have something to do with me then being able to say /s/ through there.

JOHNSON—Yes, exactly right. The people who are writing speech therapy programs are indeed slicing speech behaviors into the basic requisite skills and then moving from there. For example, there is a commercially available programed *S-Pack* which moves the child through behaviors such as "put your teeth together" before moving to practice with the phoneme itself.

JOHNSON—I really get the feeling that we therapists have a tendency to overrefine our pinpoints and bog the child down in minutia when what is crucial is to get him going in some meaningful context. The whole point is that the pinpoint or definition of correct response should only be as refined as is functionally necessary.

Beste, L. R. Spastic dysphonia: A review of literature and case study. Unpublished masters thesis, Utah State University, 1971.

Coomes, C. R. W. The effect of clinical experience on the verbal behavior of speech clinicians. Unpublished masters thesis, Utah State University, 1967.

Diedrich, W. M. Procedures for counting and charting a target phoneme. *Language, Speech, and Hearing Services in Schools*, 1971, **5**, 18-32. (a)

Diedrich, W. M. Training speech clinicians in the recording and analysis of articulatory behavior. Year II Summary Report, 1971, Special Project, US Office of Education Grant No. OEG 261293-3402(031). (b)

Elbert, M., Shelton, R. L., & Arndt, W. B. A task for evaluation of articulation change: I. Development of methodology. *Journal of Speech and Hearing Disabilities*, 1967, **10**(2), 281-288.

Lee, L. Developmental sentence types: A method for comparing normal and deviant syntactic development. *Journal of Speech and Hearing Disabilities*, 1966, **31**(4), 311-330.

Mowrer, D. E. Evaluating speech therapy through precision recording. *Journal of Speech and Hearing Disabilities*, 1969, **34**(3), 239-244. (a)

Mowrer, D. C. *Modification of speech behavior.* Tempe, Ari.: Arizona State University Speech Department, 1969. (b)

Ryan, B. P. An illustration of operant conditioning therapy for stuttering. *Conditioning in Stuttering Therapy*, Memphis: Speech Foundation of America, 1970.

Shelton, R. L., Elbert, M., & Arndt, W. B. A task for evaluation of articulation change: II. Comparison of task scores during baseline and lesson series testing. *Journal of Speech and Hearing Disabilities*, 1967, **10**(3), 578-585.

Wright, V., Shelton, R. L., & Arndt, W. B. A task for evaluation of articulation change: III. Imitative task scores compared with scores for more spontaneous tasks. *Journal of Speech and Hearing Disabilities*, 1969, **12**(4), 875-884.

The Gifted Count and Chart

ANN DELL DUNCAN

Ann Duncan had as her topic the implications of the behavioral approach for the education of the gifted. Most of these implications were found to apply to normal or other exceptional children as well. Precision teaching techniques can, however, aid in evaluating programs in which the gifted child has traditionally been placed. There are also important uses for the precision charting of personal management behavior for the quickly developing gifted child.

RESEARCH ON THE GIFTED

☐ In preparing for this presentation, I found that there was not so much gifted, behavior modification research as I had expected. Oddly enough, giftedness seems to be a fairly unpopular area. Of course, I don't mean functionally unpopular but rather in terms of material produced and studies being done. In both books and journal articles on the gifted, there is an increase around 1960, due perhaps to Sputnik, and then a gradual decrease. We need to ask some questions about what is—or what could be—going on in this field.

LACK OF PUBLIC INTEREST IN THE GIFTED

Being gifted implies a long-term future payoff.

☐ I think there are three crucial issues which contribute to this lack of interest in or work on the gifted. One is that this area is sold to the consumer on the basis of future potential. Definitions of giftedness usually imply some kind of long-term future payoff. That's too long for people.

Many people feel the gifted are "advantaged" enough.

Another reason the gifted may seem to be "neglected" is that people tend to feel that gifted children are "advantaged" enough. They say things like, "Why should we do something for them? They're going to learn anyway, right?" Yet, in many schools, our gifted children are in a sense learning disabled. Many are not allowed to go on at their own rate but are kept at the level of the class. Even if there are enrichment programs, we don't really have any way of tracking the impact of these methods—the gifted child's teaching his peers, for example—*on his own learning.*

I'll just touch briefly on a third problem here. There seem to be an old guard and a new guard involved in research of the gifted, and each group is strongly committed to their own position. We need lots of new information and insights freely explored instead.

GIFTED ACQUIRE NEW INFORMATION QUICKLY

People we call gifted not only learn fast but make and withstand many errors.

☐ One problem, of course, in dealing with giftedness is deciding to whom the term applies. I really do believe that when we talk about giftedness, one of the things we mean is a high rate of acquisition of new information. So a definition might include a look at the slope at which learning occurs. There is a second important element of giftedness, I think, and that is the ability to withstand failure. I'm getting some data which substantiate the idea that the people we call gifted are not only people who learn fast, but they also learn with a lot of failure.

There is a need for a very accelerated curriculum if the child is not to be bored to tears.

Here are two charts from a gifted first grader. Kim is doing flash cards. The first time was straight call out and the second was after 5 or 10 minutes instruction on the word sheet. First she tried 75 new words at a time, then 95, and then 100. Her acceleration rate is substantial as is her deceleration of errors. The slopes are much steeper than those of "normal" children who increase at about times 2. And Kim's deceleration, dividing errors by 1,000 a week, shows the need for a very accelerated curriculum if the child is not to be bored to tears, as she was before her transfer to an accelerated class (Figures 1 and 2).

I am concerned about how much time gifted children are merely given practice work in the classroom. Learning is growth, and if a child is constantly performing at a high accuracy level (getting many right answers and few wrong ones), he is not really improving his rate or "growing."

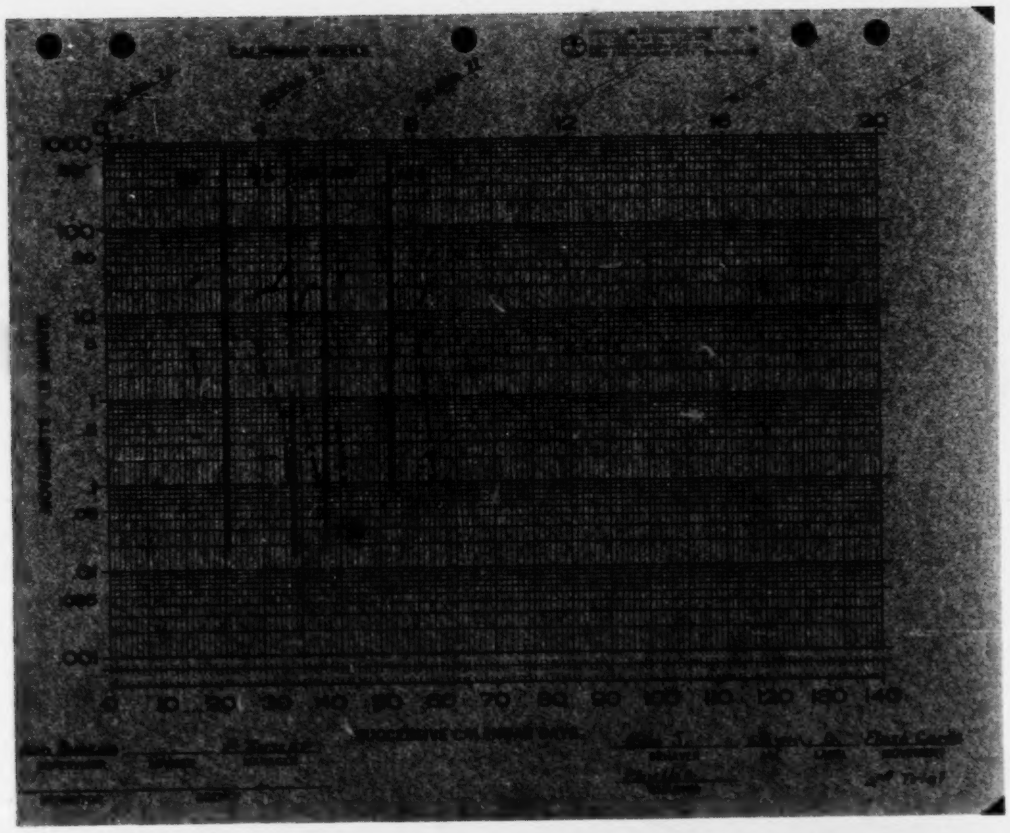


Figure 1. Kim's First Trial with Flash Cards

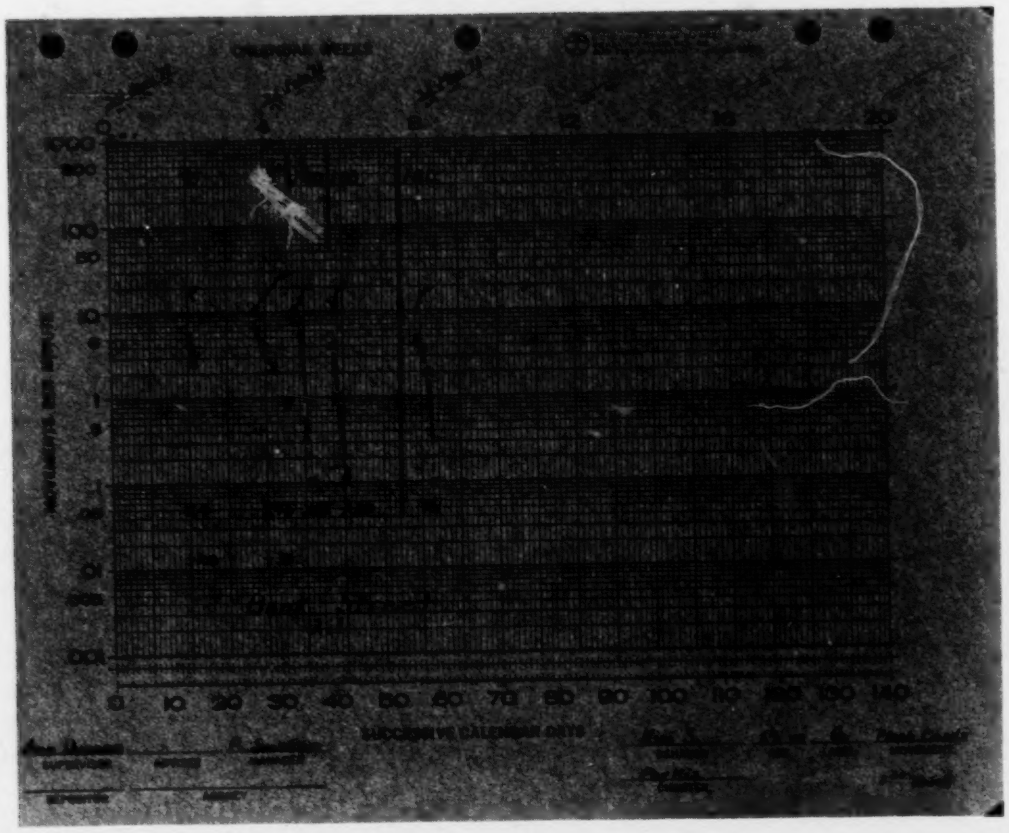


Figure 2. Kim's Second Trial with Flash Cards

THE IMPORTANCE OF ERRORS

A curriculum might be evaluated in terms of providing rather than eliminating errors.

☐ Without errors, I don't think learning really occurs. With the precise information provided by precision teaching tools, we could rearrange the curriculum to *get errors up* and keep learning going on for the gifted child. I'm not suggesting that we put them at a frustration level in the traditional sense of the term, but rather take the onus off failure. Thus, a curriculum might be evaluated in terms of providing rather than eliminating errors.

Precision teaching allows a tailor-made program for each unique child, gifted or not.

Now let me not fall into the abyss of saying gifted kids know it all. They don't, of course. They learn one step at a time just like everybody else. They put one foot in front of the other. My only hunch is that their feet go a little bit faster than most of us program for. However, with these new techniques made available to us now, you can tailor a program for each unique child, gifted or not, and the gifted need no longer be handicapped the way they have been in traditional classrooms.

PERSONAL MANAGEMENT FOR THE GIFTED

☐ Another problem gifted children have traditionally had in school is coping with their "differentness," and this brings me to my second major concern: personal management. I use this term as an alternative to self-control. What we are really talking about is what happens when your right hand reaches out and grabs your left hand. That's personal. And management means making decisions about your own life. And the way you manage your own personal life is by having the tools with which to do it.

Don't call me gifted–I don't want to be different!

Certainly the area of personal management is important to everyone, but there are several reasons it is particularly important for the gifted. If they, in fact, do proceed at a faster rate than the rest of us, then there is nobody up ahead of them managing for them. Secondly, there is the adjustment problem I mentioned before, and that is quite prevalent in the available literature. Gifted children often say things like, "Don't call me gifted because I don't want to be different from the other kids," and "Sure you can give me a harder textbook, but don't tell anybody I've got one." I think these dimensions are crucial.

Here is an example from a group of United Nations International High School gifted teenagers. These kids are counting all sorts of behavior, laziness, laughing at other people, and so on, and the things are just going away. Laura and Joanne are charting "forbidden foods," probably junk food. Both went down when change procedures were instituted or even threatened (Figure 3). Counting and charting seems to be working for them.

The gifted are more like average children on their personal management targets.

One interesting thing about these charts is that their slopes are not so steep as the curriculum charts. They are more like average children on the personal management targets. And let me emphasize again that gifted children are essentially "just like everyone else," excepting their faster acquisition of new knowledge. Thus nothing that's been said here is not transferable to the unique child, that is, any child. However, I would like to emphasize what the implications of the behavioral approach to education in general can mean to the gifted in particular.

If we believe that these gifted children are going to be the leaders

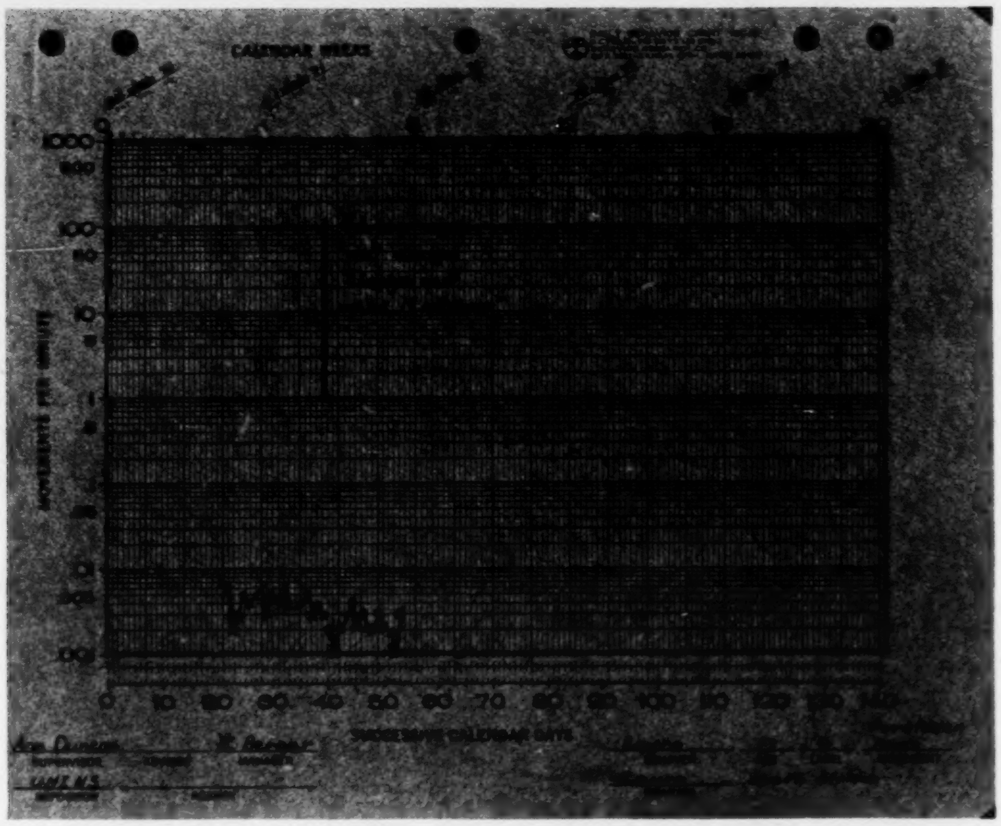


Figure 3. Laura Charting Forbidden Foods

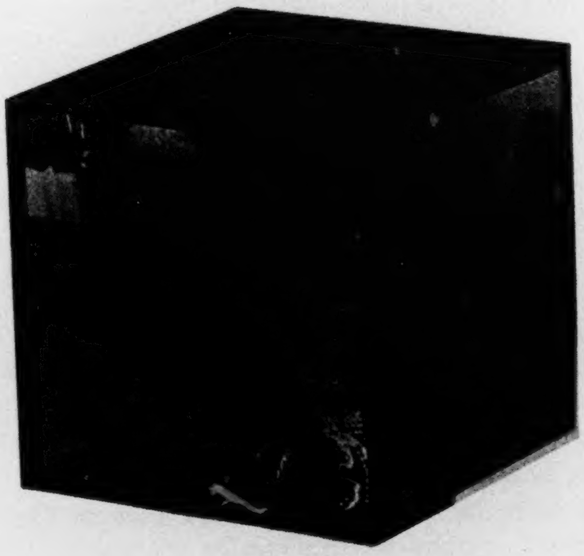
of tomorrow, I do not see how we can fail to make the effort to teach them *precise* personal management skills from the ground up. If they know these skills and how to manage their own lives, then, to borrow my favorite quote from Skinner, "If man can begin to do that, then maybe he can begin to make a better man tomorrow."

Precise personal mangement skills allow us to manage our own lives.

Imagine You're the Parent of a Deaf-Blind Child

BONNIE JEAN YOUNG

The shortage of teachers trained specifically to deal with the problems of deaf-blind children is so great that new resources need to be found to supplement existing personnel. This new resource is parents. Bonnie Jean Young based her presentation on several programs which experimented with training parents to be the teachers of their deaf-blind youngsters. Both staff and parents were very encouraged by the improvement in the children's skills and the ability of the parents to learn successful training techniques. Although these techniques were essentially behavior modification procedures, there was a lack of precise pinpointing and charting. Dr. Young saw this as a serious flaw in the programs which therefore yielded little data on how training methods might be improved or how the successes of the programs might be duplicated elsewhere. Since it is possible to make parents into efficient behavior modifiers of their deaf-blind children, all the resources of the behavior modification technology should be put at their disposal.



THE PARENTS' DILEMMA

☐ More people should be involved in the activity of teaching deaf-blind children. Imagine that you are the parent of a deaf-blind child. You smile, you coo, you talk to your child, but he does not respond to you. You don't know what to do. And so you get turned off. You may have had other children before, but the same overtures you made to those children don't make this child respond to you. It is frightening, and a disparity begins to develop between what you the parent need from the child and what the child can provide. A vicious cycle starts. As the parent gets more turned off, the child gets more and more relegated to the realm of the cradle and has nothing to respond to him in the world.

The child does not respond...is relegated to the cradle.

If you are the parent of a deaf-blind child, your child is one of an estimated 10,000 in the United States (Herzog, 1971). More are being identified every day. But in a country where there is a teacher surplus, very few teachers know how to teach your child. In 1968 and 1969, the only teacher training program in deaf-blind was at Perkins School for the Blind. Seventeen teachers were in training. A number of these came from foreign countries and went back home to teach. Even though the US Office of Education has sponsored six training programs for teachers of the deaf-blind, the number of trained teachers is still inadequate. And if you assume that a maximum ratio of children to teach is three children to one teacher, mathematics will tell you that the number of deaf-blind children that need instruction cannot be accommodated by the current numbers in training programs. It's just an impossibility.

If you are the parent of a deaf-blind child, you can't wait.

The critical time is now. If you are the parent of a deaf-blind child, you can't wait. You can't wait for training programs to produce X number of teachers who probably won't be available to teach your child. The critical time for you is now. My major premise is that the few teachers of the deaf-blind must use the additional resource available to them—parents. Parents want to learn to communicate with the children who have not yet responded to them.

TRAINING THE PARENTS

☐ The need for additional manpower produced action in the Portland, Oregon Public Schools in the summer of 1967. Feeling that there must be a way to extend services, the Child Service Center staff developed a program called The Preschool Deaf-Blind Project, funded under Title VI, Education of the Handicapped. Teachers of the deaf and of the blind were housed with 10 deaf-blind preschool children at the Vancouver, Washington School for the Blind. The purposes of the project were to identify behaviors of those 4 and 5 year old deaf-blind children that needed improvement and to teach parents how to use behavior modification techniques. Five children came in the morning and five in the afternoon. A special bus transported the children from as far away as Scappoose, St. Helens, and Gresham, Oregon. The teachers worked with the children four days a week. On the fifth day, the parents were brought to the center to see their child's progress and to learn how to continue reinforcing the newly acquired skills.

My role in this project was strictly that of an observer. I came in as part of a training program for teachers of the visually handicapped and was to talk with parents about their impressions of the project as it progressed. Although one young man had some experience with precision teaching, not a single chart was in evidence. Although behaviors were specified and the teachers worked with the children to improve their performance, the problem as I saw it was the lack of precision data. The staff recognized the need for specific data about the rate of movement. In other words, there was no way of knowing exactly what was happening to the pinpoint or to the child's behavior.

There was not a single chart in evidence...

. . .a lack of specific data.

On the other hand, in global terms, the kids were "turning on." One little boy who used to eat everything within reach was suddenly able to sit and wait to eat only his cookies and drink only his juice. A little five year old who leaned on everyone when he came to the preschool was now able to walk up and down stairs without assistance. He was able to run on asphalt pavement and to locate a designated tree in the yard. He became mobile.

In global terms, the kids were turning on.

Many deaf-blind children exhibit "light addiction." They gravitate toward light and hold their fingers in front of their eyes to produce sensation by filtering the light. Children were modified out of this behavior, and some dropped it completely in favor of other more acceptable behaviors.

The teachers in the project commented about these successes with global statements such as: "It is much easier to train children at this early age than when we get them later." When pressed to be more specific, their response was: "It used to take us a whole year to train a leaning child to walk on his own. In this program, in 6 weeks, we can train him to walk up and down stairs, run, and locate objects."

The staff felt the need to specify the rate of acquisition of certain kinds of behavior. Although the identified behaviors were supposed to be counted and the data were supposed to be kept on precision teaching charts, the teachers never saw the charts. The teachers said that if they had looked at them they wouldn't have known what the data meant anyhow. Which brings us to another point: we have to train people to read and understand the charts, if the data is to be valuable. The teachers have to be actively involved in collecting and interpreting data. This business of one person collecting data and someone else doing the teaching and "never the twain shall meet" has to cease.

There was no data on how success was achieved.

We've got to train people to read and understand charts.

The lack of counting behavior continued in the parent training aspect of the program. As the teachers developed techniques of teaching these children, they brought the parents in. The parents were then instructed for an hour each week on how to work with the

Parents really never had a measuring tool to know how successful they were.

children. The new method was demonstrated and then the parent tried it with the child. But the parents never counted, and they never kept data. The parents really never had a measuring tool to know how successful they were. All they had was a global feeling of "now we can do this and before we couldn't do anything."

The program "made me feel like a parent again."

Nevertheless, the parents were delighted with the project. Here are some of the things they told me. One mother said she had had no idea of how to teach her daughter before. She and her husband had always loved to play with their other children, but this child did not respond. The child even rejected efforts to feed her. Now the mother has learned methods of getting the child to eat certain kinds of foods. Another parent said, "I had no place to turn until I talked with Mrs. Laura Zetsche (the child development service counselor). She is like an angel to me. Now at least I know what to do and what behaviors to expect from my little girl. Mrs. Zetsche made me feel like a parent again."

This was the bonus outcome of the project. Parents of the deaf-blind often really do not feel like parents. They feel as though they have been rejected by their children, and so they opt out on their responsibilities in turn. As the project continued, parents who had been "turned off" suddenly "turned on." They assumed their roles as parents when professionals pinpointed the specific behaviors they could work on and taught them how to use behavior modification.

Parents are a tremendous new resource.

There were two positive and encouraging outcomes of this project. First, a decided "yes" was given to the question of whether parents can be trained to work successfully with deaf-blind children. We are now training a target population of teachers and teacher trainers, but we also need to train parents to work with their own youngsters. They would be a tremendous new resource. Perhaps we need a Council for Exceptional Children task force to plan parent training projects. Second, the experience in the Portland project supports the conclusion that early intervention at 4 or 5 years of age produces learning at a faster rate than intervention at a later time.

The success of the 1967 summer project paved the way for other summer projects, and the 1970-71 and 1971-72 school year preschool programs were sponsored by the Portland Regional Facility for the Education of Blind Children and funded under Title VI-C, Northwest Regional Center for Deaf-Blind Children.

PROBLEMS CHARTING BEHAVIOR OF DEAF-BLIND

☐ In the summers of 1968, 1969, and 1970 the Portland project was replicated. Feeling that data collection in terms of precision teaching was a problem, the 1968 staff cut down the number of pinpoints. Three target behaviors were selected, but the data were not collected on precision teaching charts. Pictorial representations via color prints, slides, and videotapes of "before" and "after" are impressive accounts of the projects' successes. The 1970-72 project staff used a "before and after" checklist of behaviors and specified behavioral goals for the project. (Videotapes and reports are available from Ray Myers, Specialist Visual Education, Oregon Board of Education, 700 Church St. SE, Salem, Oregon 97310.) But we don't know at what rate these children were able to perform or exactly when they had acquisition. Without data to guide them, teachers may spend more time than is necessary on teaching a certain skill.

Without data to guide them, teachers may over-teach certain skills.

One of the problems of working with deaf-blind children is that you must work with hands and mouth at the same time you're working with the child. So the objection to recording precise data during the project was, "We can't even make a tally mark, and we can't speak out loud because the child is feeling the mouth for vibrations. You can't confuse him by presenting extraneous clues." However, teachers could use a mechanical foot instrument that records on a six button tracking system, a multiple pin device. Certainly a way can be found to collect precise data if the teachers learn how to use the data in making on the spot decisions about the instruction process.

Recording data is difficult but not impossible.

IDENTIFYING AND PINPOINTING SKILLS

☐ The key to successful parent training is the identification of skills. We have about five skill sequences that are at least useful in terms of the behavior of deaf-blind children. The first is the AAMD Adaptive Behavior Project, Parsons State Hospital and Training Centers. The second is a curriculum guide by Miss Isora Berrera of the San Antonio, Texas Program, Castle Hills Elementary School, Northeast Independent School District. The Personal and Social Development Scale developed by the US Office of Education Deaf-Blind Preschool Project, San Francisco State College is a third; and fourth is the Washington Assessment and Training Scales, called WATS, developed by the Inter-Institutional Assessment and Training Scales Committee, Office of Handicapped Children, State of Washington. There is also a guide prepared by Portland Public Schools Child Service Center.

All of these scales are inventory type of data, although some are more precise than others. They at least offer a start in the area of pinpoints. However, they are not stated in frequency terms. It's not "tie shoes per minute" but just "tie shoes." And, of course, there are no charts. These two rating sheets (Figures 1 and 2) should indicate how cumbersome this kind of recording is. The first or D sheet is directed learning and the second undirected time. A page from the Adaptive Behavior Scale (Figure 3) provides similar pinpoints but in an equally unmanageable format for precision teachers.

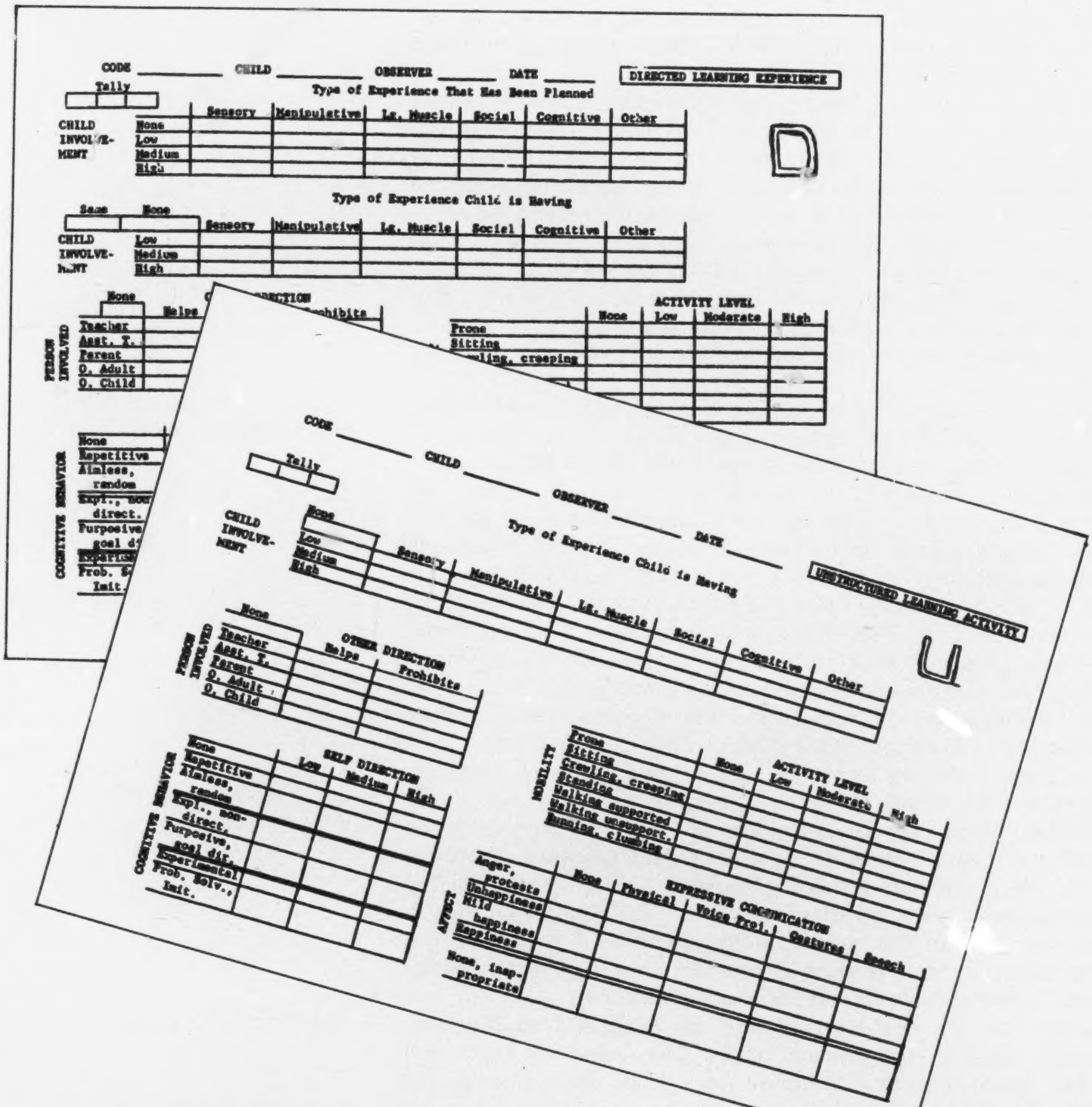
Inventory data is cumbersome... unmanageable for precision teachers.

THE NEED FOR CHARTING

☐ Training for the deaf-blind should be adaptable to precision techniques, because the manual skills you want to teach are countable. There remains a lot more work to be done, however, in the area of contingencies. Just identifying a reinforcer for these children is a major task. One thing we did try was using light as a reinforcer. Remember, these children are strongly attracted to light. So we used it. We withheld light and then used a flashlight to admin-

Identifying reinforcers is a major task.

Figure 1. Directed Learning
This instrument developed in connection with the Deaf-Blind Pre-School Project, USOE #OEG-0-9-142147-3740(032), at San Francisco State College, Department of Special Education



CODE ________ CHILD ________ OBSERVER ______ DATE ______ DIRECTED LEARNING EXPERIENCE

D

Tally ☐☐☐

Type of Experience That Has Been Planned

CHILD INVOLVEMENT		Sensory	Manipulative	Lg. Muscle	Social	Cognitive	Other
	None						
	Low						
	Medium						
	High						

Type of Experience Child is Having

Same ☐ None ☐

CHILD INVOLVEMENT		Sensory	Manipulative	Lg. Muscle	Social	Cognitive	Other
	Low						
	Medium						
	High						

PERSON INVOLVED	None	Helps	Prohibits
Teacher			
Asst. T.			
Parent			
O. Adult			
O. Child			

ACTIVITY LEVEL

	None	Low	Moderate	High
Prone				
Sitting				
Crawling, creeping				

COGNITIVE BEHAVIOR
None
Repetitive
Aimless, random
Expl., non-direct.
Purposive, goal dir.
Experimental
Prob. S… Imit.

CODE ________ CHILD ________ OBSERVER ________ DATE ______ UNSTRUCTURED LEARNING ACTIVITY

U

Tally ☐☐☐

Type of Experience Child is Having

CHILD INVOLVEMENT		Sensory	Manipulative	Lg. Muscle	Social	Cognitive	Other
	None						
	Low						
	Medium						
	High						

OTHER DIRECTION

PERSON INVOLVED	None	Helps	Prohibits
Teacher			
Asst. T.			
Parent			
O. Adult			
O. Child			

SELF DIRECTION

COGNITIVE BEHAVIOR	Low	Medium	High
None			
Repetitive			
Aimless, random			
Expl., non-direct.			
Purposive, goal dir.			
Experimental			
Prob. Solv., Imit.			

ACTIVITY LEVEL

MOBILITY	None	Low	Moderate	High
Prone				
Sitting				
Crawling, creeping				
Standing				
Walking supported				
Walking unsupport.				
Running, climbing				

EXPRESSIVE COMMUNICATION

AFFECT	None	Physical	Voice Proj.	Gestures	Speech
Anger, protests					
Unhappiness					
Mild happiness					
Happiness					
None, inappropriate					

Figure 2. Undirected Time
This instrument developed in connection with the Deaf-Blind Pre-School Project, USOE #OEG-0-9-142147-3740(032), at San Francisco State College, Department of Special Education

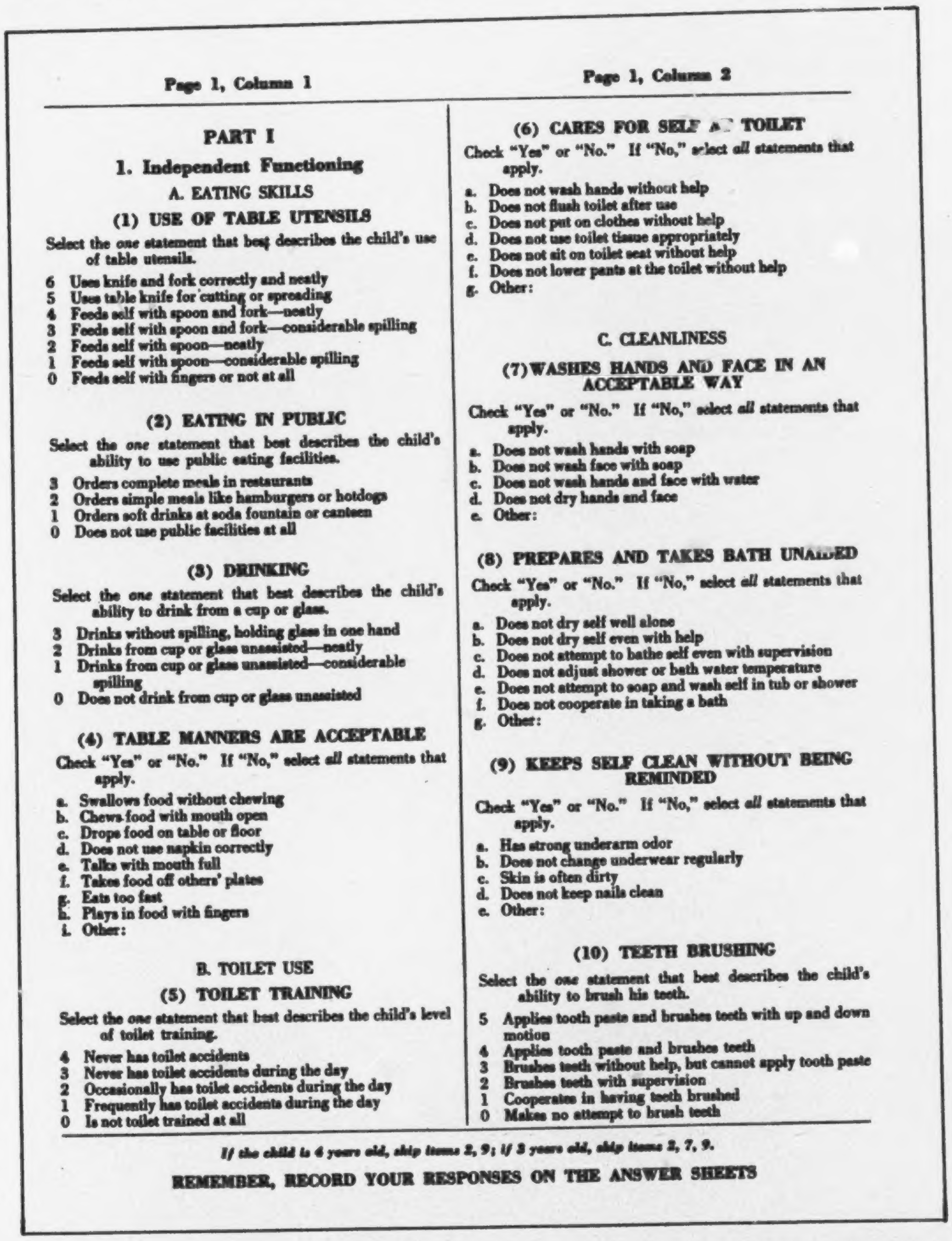


Figure 3. Section of Adaptive Behavior Scale
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Page 1, Column 1

PART I

1. Independent Functioning

A. EATING SKILLS

(1) USE OF TABLE UTENSILS

Select the *one* statement that best describes the child's use of table utensils.

6 Uses knife and fork correctly and neatly
5 Uses table knife for cutting or spreading
4 Feeds self with spoon and fork—neatly
3 Feeds self with spoon and fork—considerable spilling
2 Feeds self with spoon—neatly
1 Feeds self with spoon—considerable spilling
0 Feeds self with fingers or not at all

(2) EATING IN PUBLIC

Select the *one* statement that best describes the child's ability to use public eating facilities.

3 Orders complete meals in restaurants
2 Orders simple meals like hamburgers or hotdogs
1 Orders soft drinks at soda fountain or canteen
0 Does not use public facilities at all

(3) DRINKING

Select the *one* statement that best describes the child's ability to drink from a cup or glass.

3 Drinks without spilling, holding glass in one hand
2 Drinks from cup or glass unassisted—neatly
1 Drinks from cup or glass unassisted—considerable spilling
0 Does not drink from cup or glass unassisted

(4) TABLE MANNERS ARE ACCEPTABLE

Check "Yes" or "No." If "No," select *all* statements that apply.

a. Swallows food without chewing
b. Chews food with mouth open
c. Drops food on table or floor
d. Does not use napkin correctly
e. Talks with mouth full
f. Takes food off others' plates
g. Eats too fast
h. Plays in food with fingers
i. Other:

B. TOILET USE

(5) TOILET TRAINING

Select the *one* statement that best describes the child's level of toilet training.

4 Never has toilet accidents
3 Never has toilet accidents during the day
2 Occasionally has toilet accidents during the day
1 Frequently has toilet accidents during the day
0 Is not toilet trained at all

Page 1, Column 2

(6) CARES FOR SELF AT TOILET

Check "Yes" or "No." If "No," select *all* statements that apply.

a. Does not wash hands without help
b. Does not flush toilet after use
c. Does not put on clothes without help
d. Does not use toilet tissue appropriately
e. Does not sit on toilet seat without help
f. Does not lower pants at the toilet without help
g. Other:

C. CLEANLINESS

(7) WASHES HANDS AND FACE IN AN ACCEPTABLE WAY

Check "Yes" or "No." If "No," select *all* statements that apply.

a. Does not wash hands with soap
b. Does not wash face with soap
c. Does not wash hands and face with water
d. Does not dry hands and face
e. Other:

(8) PREPARES AND TAKES BATH UNAIDED

Check "Yes" or "No." If "No," select *all* statements that apply.

a. Does not dry self well alone
b. Does not dry self even with help
c. Does not attempt to bathe self even with supervision
d. Does not adjust shower or bath water temperature
e. Does not attempt to soap and wash self in tub or shower
f. Does not cooperate in taking a bath
g. Other:

(9) KEEPS SELF CLEAN WITHOUT BEING REMINDED

Check "Yes" or "No." If "No," select *all* statements that apply.

a. Has strong underarm odor
b. Does not change underwear regularly
c. Skin is often dirty
d. Does not keep nails clean
e. Other:

(10) TEETH BRUSHING

Select the *one* statement that best describes the child's ability to brush his teeth.

5 Applies tooth paste and brushes teeth with up and down motion
4 Applies tooth paste and brushes teeth
3 Brushes teeth without help, but cannot apply tooth paste
2 Brushes teeth with supervision
1 Cooperates in having teeth brushed
0 Makes no attempt to brush teeth

If the child is 4 years old, skip items 2, 9; if 3 years old, skip items 2, 7, 9.

REMEMBER, RECORD YOUR RESPONSES ON THE ANSWER SHEETS

ister light as a reward. The results were extraordinary; the children would do anything we wanted. But then the teachers feared we were reinforcing that addiction. Charts would have shown if we were, but, again, we did not have access to them.

Herzog, B. H. (Ed.) Preparation of Professional Personnel to Meet the Educational Needs of Deaf-Blind Children. Proceedings of Special Study Institute, March 15-17, 1971, Lincoln City, Oregon.

COMMENT—That is a major strategical problem. Traditionally this sort of data has been the material of the research scientists and not the materials to be used for daily lesson planning or as inflight instruments. It's as though the only altimeters in the world were located in research centers and people flew airplanes with empty panels. We have to use the charts for planning rather than after planning as proof that the plan was a good one. This is an important concept.

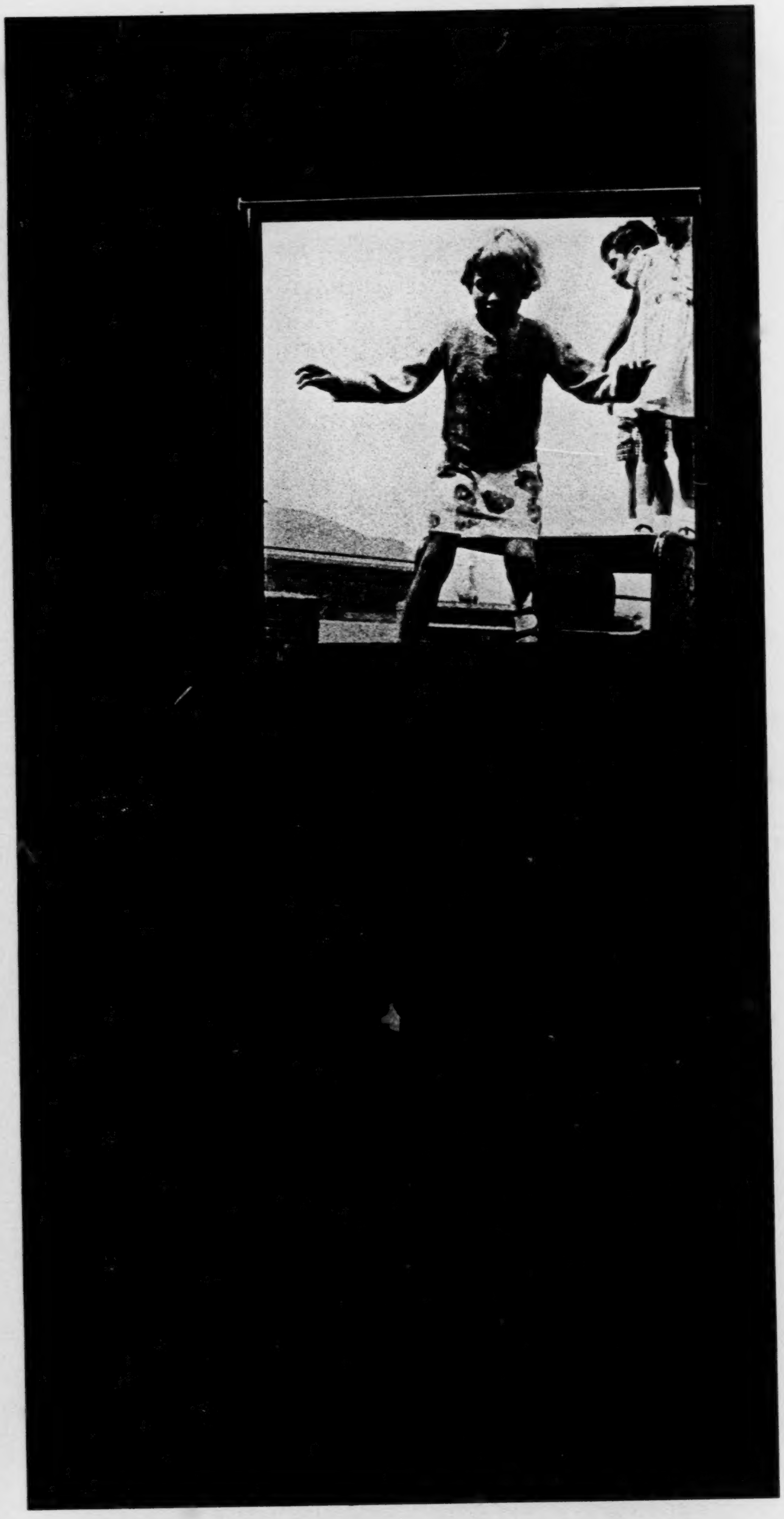
YOUNG—Yes, it is. And you can also use the charts, of course, to tell you what's wrong with a curriculum package or a reinforcement schedule. You can't be sensitive enough to spot these things without the data.

QUESTION—How do you feel about the integration of these deaf-blind children into the regular stream of education?

YOUNG—If you find that the child has residual hearing or residual vision and these abilities are enough to develop mobility, then you may be able to put him into the mainstream. But when you are looking at these little fellows, you realize that most of these children have needs which are great in terms of specific kinds of things that you don't have to train normal children to do. You don't have to train a normal child to hear a sound and to respond to it. But these kids evidently get a lot of stimuli coming at them that they cannot screen out, and they cannot identify certain other kinds of stimuli. You have to train them differently. They are the severely handicapped for whom special instruction may always be necessary.

COMMENT—But if they reach a given level of proficiency, if we could find out what their proficiencies are and what the rates, acquisition, and maintenance would look like, then you see that it could be expeditious to plug them right back in rather than keeping them out.

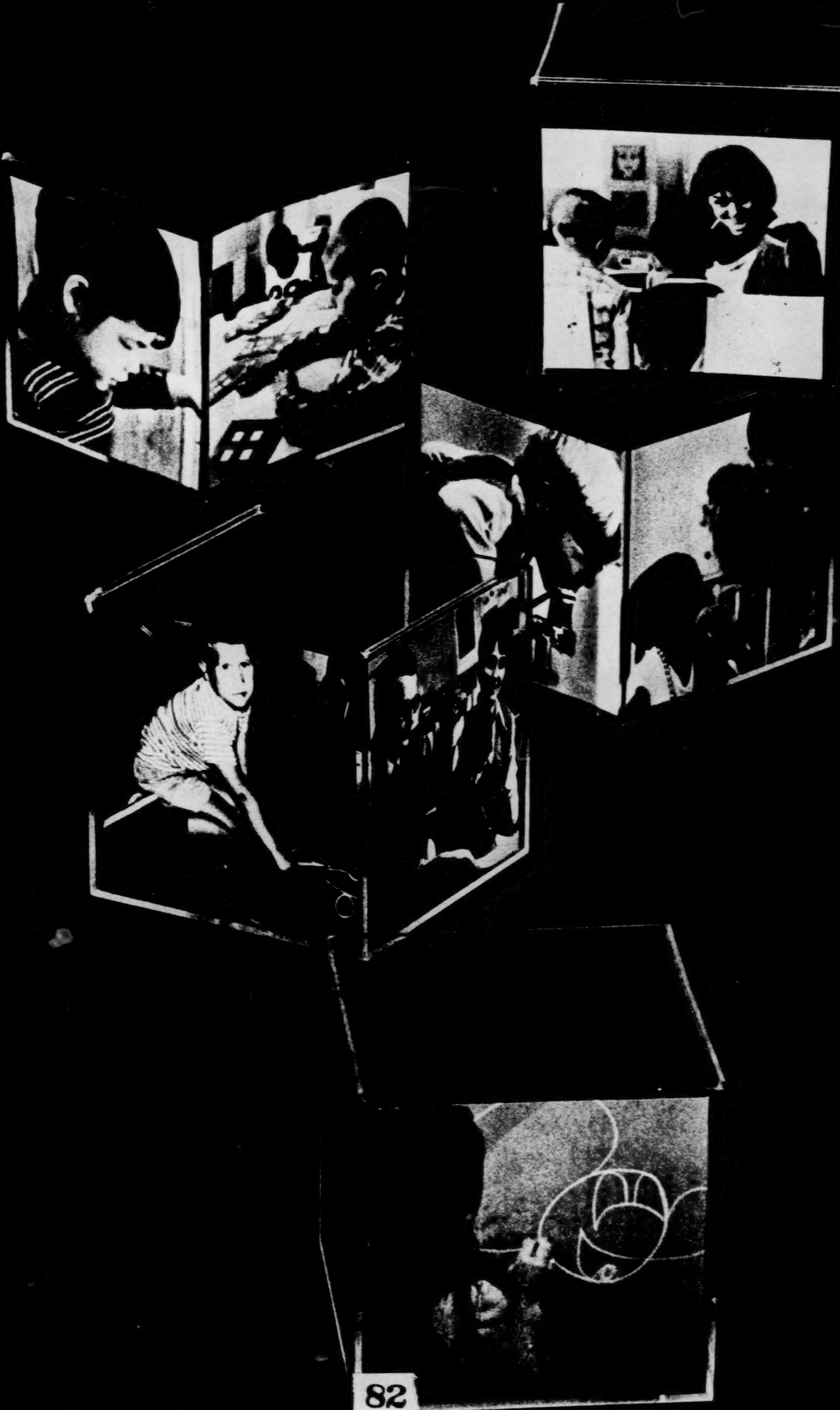
YOUNG—I think that the aims of the training program are going to have to be different. We have a lot of traditional people who believe that deaf-blind children should be trained for academic work. I walked into a program where a 23 year old deaf-blind girl was reading in Braille and typing on the typewriter "The Department of State..." and I thought, "What good is that going to do her if she can't cook, she can't sew, or she can't find her way from her home to her job?" It just looked like the target was all wrong.



These Kids Have Problems and Our Job Is to Do Something for Them

SIDNEY W. BIJOU

Since 1965, Sidney W. Bijou has been running a laboratory of classes for young problem children. The lab school trains its own staff and develops its own curriculum according to the principles of behavior analysis. Dr. Bijou emphasized in his presentation that the classroom is a learning environment to be structured by the teacher. From his experiences in special teaching, he believes strongly that the use of the behavior analysis techniques which work with children in the lab school should be expanded to include all children, and thus make all education special education.



THE CHILD BEHAVIOR LABORATORY SCHOOL

☐ The major purpose of the Child Behavior Laboratory School is to fabricate a technology of special teaching. We have two collateral happenings: We have school problem children in a classroom setting and behaviorally trained teachers who are trying to help them, and a situation for producing research. It is in this context, this microcosm, that we attempt to develop teaching procedures for the young handicapped child.

In appearance, there is nothing very unusual about our setup. We wanted classrooms that would look not like a laboratory but like regular classrooms, yet having a necessary, but nonobvious laboratory feature, namely, observation devices (Figure 1).

We use a regular classroom with observation devices built in.

Two existing classrooms in the lab school were redesigned with an observation room situated between them, and three smaller rooms created at one side of each classroom. One small room is a lavatory; one is a "wet room" where children can go to play with finger paints, clay, or other "messy" materials, and the third is a tutors' room. Designed originally to be a "quiet room" for activities like reading, drawing, etc., it has worked out to be, more practically, a "tutoring" room where an assistant works alone with a child. More rooms are available downstairs in the building for individual work with children, for special tutoring, or for studying specific learning problems (Figure 2).

We want children just beginning to be problems and to do something for them before they have been branded.

Our student population, 14 at present, is made up of young, "problem" kids. We insist upon getting them young, between 5 and 7 years old, for an obvious reason: We want children who are just beginning to be considered school problems and we want to do something for them before they have been "branded." This does not mean that their problems are not serious. We have the most severe problem behavior children in our area, those who are impossible to handle in a public school situation, those whose parents have been warned that other arrangements will have to be made for the education of their children. Referrals to us are made by schools or social agencies, or by requests from the parents themselves.

As might be expected, such children fall into two main categories: the highly aggressive ones who are destructive, disruptive, and combative; and those who just sit in class doing nothing.

When you are sincerely interested in devising a program for a particular child, a label contributes not one bit!

It is at this point, generally, that one is expected to say something about diagnostic categories. But to me labels are meaningless. It does us no good to call children retarded, or emotionally disturbed, or immature, or what have you, because, as you all know very well, the "diagnosis" doesn't help in the least. When it comes to doing an educational job, when you are sincerely interested in a child and want to devise a program for that particular child, the label contributes not one bit to your understanding of how to proceed. These kids have problems, and our job is to do something about them!

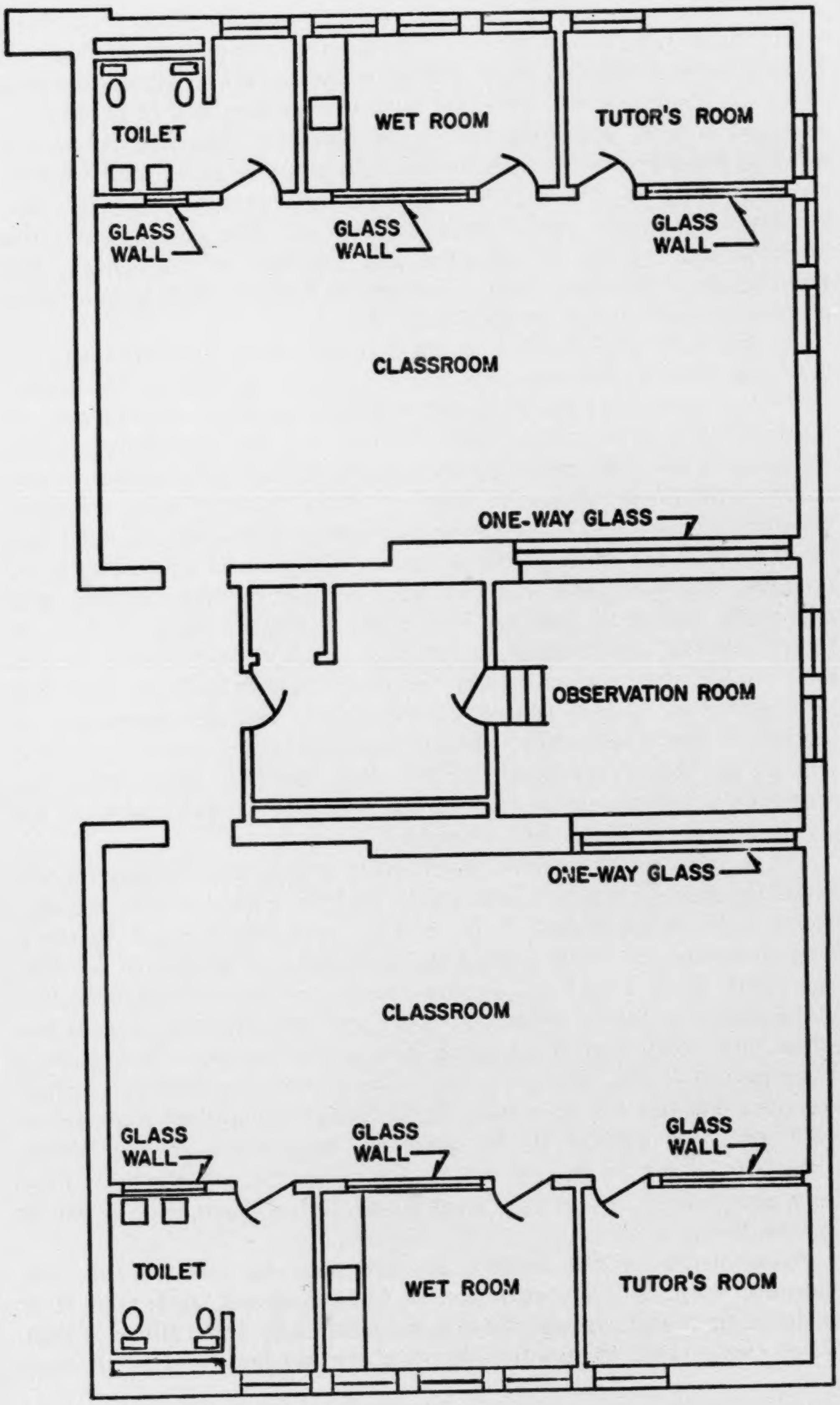
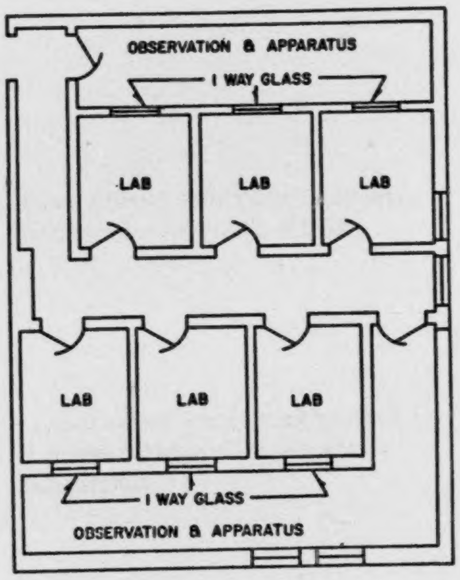

TOILET
WET ROOM
TUTOR'S ROOM
GLASS WALL
GLASS WALL
GLASS WALL
CLASSROOM
ONE-WAY GLASS
OBSERVATION ROOM
ONE-WAY GLASS
CLASSROOM
GLASS WALL
GLASS WALL
GLASS WALL
TOILET
WET ROOM
TUTOR'S ROOM

Figure 1. Laboratory School Classrooms

Figure 2. Rooms for Individual Work


OBSERVATION & APPARATUS
I WAY GLASS
LAB
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I WAY GLASS
OBSERVATION & APPARATUS

The way we, at the Child Behavior Laboratory, do something about these kids is first to create an educational environment which facilitates learning. Our main job is to alter or eliminate certain of a child's behaviors which interfere with his learning and to get him on his way in both academic and social behavior. The key to all our work is the behavioral conception of teaching. We agree with Skinner that teaching is the process whereby the person in charge, the teacher, arranges the contingencies of the classroom, the environment, so as to expedite the learning of the child. The technology of teaching, then, really boils down to *how* you arrange an environment to achieve this end.

Teaching is the process whereby the teacher arranges the environment to expedite the learning of the child.

If you view the education process as one which opens the way for learning, then all the essential steps in teaching follow. Obviously, before you can start working with a child, you need a curriculum, an individualized instructional plan for him. At the laboratory school, we prepare our own materials because the school achievement of our students is lower than the level of most commercially prepared programs. Regardless of the type of material you use, you need lots of it so that the teacher has as much of a variety of resources as possible. We have developed our own writing, reading, spelling, and arithmetic programs, and we emphasize the acquisition of skills in these subjects. Incidentally, I think one reason that recent studies have shown that special classes for handicapped children have not been effective is that special teachers have devoted themselves to matters other than those which are the main mission of the school—to teach academic skills. This doesn't mean that the academic programs are all the children get when they're with us. We just make certain they aren't neglected.

The flexible format...

...during each study period, each child is doing his own thing.

After some experimentation, we have arrived at a flexible format based on dividing the day into study periods. For example, the day begins with study periods I, II, and III, and then a break or story time, followed by study period IV, study period V, and so on. For each study period, each child is assigned a particular activity which is contained in a colored folder. A wall chart indicates the color of the folder the child should be using during that period. Thus, during study period I, the child pulls out his red folder and does his reading exercises. He has his own specially prepared programed material to work on. For period II, he does his assignment in the green, arithmetic folder. In the same way, he works through the rest of his daily assignments. So during each study period, each child is doing his own thing.

Setting factors are important... putting kids in a good mood is functional.

Assignments in the folders are prepared by the teachers the afternoon before. All instruction is individualized. Although it is costly in time and money, there is no other way I can think of that allows every child to function at his particular level and at his own rate.

The idea of the classroom as a learning environment carries with it the concept of "setting factors." They make up the atmosphere or context in which classroom activities take place. For example, the teacher is trained in techniques of getting the kids in a good mood at the beginning of the school day. The children are offered breakfast when they come in, because for various reasons, many haven't had breakfast before leaving home. While the children are eating, the teacher and aides talk informally with them, joke with them, admire an article of clothing, etc., and try in general to get them to feel good. We do not have objective data on the effect of this type of setting factor, but the indications are that having the children start the day in this very personal and interpersonal way is a desirable practice.

THE TEACHER: MOST IMPORTANT ELEMENT OF LEARNING ENVIRONMENT

☐ There isn't any question that the most important thing about what happens in a special classroom—any classroom for that matter—is the behavior of the teacher. We can have the best materials and the most modern teaching machines, but they are all useless unless the person in charge knows how to use them to initiate and accelerate desirable behavior.

The best materials and machines are useless unless the teacher knows how to use them to help the child.

At the Child Behavior Laboratory, we train our teachers in the procedures they will use in the classroom. Training includes not only teaching techniques but also skills that the teacher can use to train others. We believe that the teacher should train her own personnel, whether they be high school or college students, aides, or other teachers. She is the one who should be able to tell each person exactly what she wants him to do, what role to play, and so on. She should, furthermore, be capable of taking a leadership role with parents; that's also part of her training and responsibility. If we do our job right, if our training of the teacher according to specific principles is effective, then she should be able to train others whenever it is necessary.

FIVE SKILLS FOR SUCCESSFUL TEACHING

☐ More specifically, our teacher training involves five skills which the teacher should acquire, if she does not already have them. First, she should be able to assess a child's entering behavioral repertories. Second, she should know how to plan a program, and having done so, she must be equally adept at modifying it. Part of the modifying of the program includes the third point: knowing techniques of contingency management. These techniques are used in the fourth skill as well: modifying the child's social behavior and precurrent academic behavior. To do all the above, the teacher must know, lastly, how to monitor the behavior of the child.

Because the teacher's plans for each child are based largely upon the child's entrance behaviors, it is only logical that she herself do the initial assessment. She is the one who needs to know as much as possible about the child, and while assessing his behavioral

Because the teacher plans for each child, it is only logical that she do the initial assessment.

repertories she can uncover and discover many pieces of information that a psychologist might fail to transmit to her.

In many instances, the gathering of information of initial repertories begins before the child is enrolled in the class. When possible, our teachers visit the public school class in which a referred child is having difficulties and observe him in that environment. That experience provides her with the first bit of data. After enrollment in the laboratory class, he is given a few days to settle down in his new environment before the teacher runs him through an inventory type of assessment procedure to determine what he can do, both socially and academically. On the basis of these two types of information, the teacher makes up the beginning program for the child.

An effective teacher must learn that she not only can, but often must, modify an existing program.

This leads us to the program itself. The material for each child is carefully programed, the teacher deciding on the basis of each day's accomplishments what the next day's assignments will be. Obviously she has to know the contents of the programs, how to put together materials she already has, and even more importantly, as I said earlier, how to modify them if the child's performance indicates that this is necessary. The alteration of materials has occasionally presented a problem, for teachers and students have traditionally been taught not to tamper with printed material, those "scientifically" devised, commercially prepared books and programs. But an effective teacher must learn that she not only can, but often must, modify an existing program. Our teachers are trained to take apart a program at any time and put it together in any combination of ways in order to deal with a child's deficit. It isn't a very complicated procedure. Since "bought" programs so far aren't especially good, so much of what we receive being hit and miss material anyway, it is essential to adapt them for special purposes.

An important two-fold aim in the programing of any material is to avoid assignments that are too difficult, and thus lead to a high error rate, and to avoid, as well, assignments that are too easy, a situation that results in the kind of aversiveness that accompanies mere repetition of learned tasks. In other words, the teacher should adjust the materials to help make progress possible.

Machines are not essential...

We do not use complicated and expensive teaching machines. We prefer to demonstrate that machines are not essential to a successful program. What is important is well thought-out, interesting materials, properly presented.

The only way you can proceed with a program like this is on the basis of what the child is doing. So all the child's activities are monitored, and then analyzed. An observant, well trained teacher consequently knows pretty well what assignment is called for, and if it doesn't work, she knows how to change it until it does work.

. . .but well thought-out interesting materials presented the proper way are!

In addition to assessing each child and modifying programs, the teacher should know how to manage contingencies to facilitate learning. This involves the use of prompts, primes, probes, etc., for getting out initial responses which can then be reinforced, and also the use of the reinforcers. In addition to social and "natural" reinforcers, we use contrived reinforcers. Our children are, after all, extremely difficult to manage. While it is true that contrived reinforcers aren't necessary for some of the children, all are nevertheless put on a "mark" system. Accompanying the "mark" system for desirable behavior is the use of social reinforcement—praise, a smile, etc. A percentage reinforcement schedule is used to wean the child from the "mark" system. This means that the proportion of time in which a contrived reinforcer (a mark) is given simultaneously with a social reinforcer is gradually reduced. Initially in the program, when the child responds, the contrived and social reinforcers are paired 100 percent of the time. Gradually, as observation of the child's behavior indicates, the percentage is decreased until the social reinforcement alone is sufficient to keep the child working at his task. Weaning him from contrived reinforcers prepares the child to perform in situations devoid of them.

Weaning him from contrived reinforcers prepares the child to perform in situations devoid of them.

Evaluating the effectiveness of reinforcers for a particular child requires far more than an impression of what a child likes or what a teacher thinks he would or should like. It requires extended observation of the child's behavior to determine the consequences which keep him on an activity. The teacher should always be vigilant in seeking new reinforcers that are at least equal to, and preferably, even more effective than those she is presently using, if for no other reason than to avoid decreases in the child's academic or social proficiencies because he has been given too many reinforcers of the same sort.

The teacher should be vigilant in seeking new and more effective reinforcers.

We are also interested in modifying social behavior and in building precurrent, or study, behavior. Thus the teacher must be able to use behavioral techniques to teach the child how to learn and how to behave appropriately in the classroom. This involves eliminating behaviors that interfere with learning and encouraging those behaviors that help one child to work with another and to perform successfully in the classroom. Included may be such diverse behaviors as getting a child to stop hitting another child or merely to hang up his coat upon entering the classroom. The well trained teacher must carry "in her head" programs for shaping these sorts of behavior change. The sophisticated teacher becomes quite adept at this type of management.

We try to eliminate social behaviors which interfere with learning.

We wouldn't think of teaching new social or academic behavior without some kind of a monitoring procedure to let us know how we

Monitoring the child's behavior is an integral part of the behavioral classroom.

are doing. Monitoring is an integral part of any behavioral classroom. Hence, the teacher and her assistant must know how to monitor and record the behavior of the child. Graphs of each child's performance are mounted for convenience on the walls of the teachers' offices or kept in looseleaf books.

What can the charts tell us?

What is most important to me is what follows from the information on the charts. What can the teacher do with this information? First, she can ask, "Are the contingencies effective for this child? Are they strong enough?" Secondly, "What about the material itself? Should it be rearranged or completely altered?" And thirdly, "Do we need to change some 'setting event', such as the period in which the assignment is given?" Even when we see no difficulties, even when a child is doing well, we should still ask, "Could he do better? Are we holding him down in some way?" And that's still not enough. We must go on to ask, "Is he productive?" "Is he happy?" " Is the work challenging?", etc. Only positive answers are acceptable.

OPTIMISM BUILT INTO BEHAVIOR ANALYSIS APPROACH

The teacher knows the child can learn and she can arrange the environment to help him.

☐ The five skills I have discussed are the minimum requirements for effective teaching. There is one other thing. It is not so much a skill as a personal characteristic—an attitude. And that attitude is one of optimism. If you believe the principles of the behavioral approach, then an optimistic approach is the only one with which you can function. You believe that this child can learn and that you can arrange the environment to help him learn. You cannot indulge yourself in the luxury of saying, "He's too stupid," or "He must be brain damaged." You naturally embrace an attitude of "Let's try doing something else kind of thing."

...a technology with assessment and improvement procedures at the heart of it.

As I have intimated, optimism is more or less built into our educational approach. What we have at this point is the very modest beginning of what we can ultimately develop. Our technology of teaching is improving in at least two ways. First, it is automatically modified as we try to improve our daily services to the students, as we shift things around to increase their output of work and other behaviors. And secondly, research that comes out of the practice of the technology provides data on some of the effects of the program, as, for example, the behavioral effects of the schedule of reinforcement. Continuing along these lines, we shall have an enriched theory to draw on, as well as a technology with assessment and improvement procedures at the heart of it.

All regular classes must in fact, and not in theory, become special classes.

The success of a child after he leaves our program is, of course, of greatest concern. The goal of our program is to prepare a child, academically and socially, so that he can return to a regular public school classroom. If he is assigned to a class where the teacher is willing to take up where we have left off, he probably will continue to make progress. If the class is radically different from ours and regimentation reigns, if there is little individual instruction and only intermittent reinforcement, then the prognosis is not too good. It follows, then, that the teaching in regular public school classes must be changed; all classes must in fact, and not in theory, become special classes. To be successful, our whole special class venture must, in a sense, result in getting rid of special classes, and our methods must be integrated into the regular schools so that there will be no failures in the first place.

THE PRACTICAL IMPLICATIONS OF BEHAVIOR ANALYSIS

☐ Briefly, the practical implications of behavioral analysis special teaching are these: (a) Classes with a motivational plan based on positive (extrinsic and intrinsic) reinforcers that are meaningful (functional) for each child. (b) Programed instruction in academic subjects and teachers skilled in arranging conditions that will encourage academic and social learning. Children would thus be provided with an educational environment not only conducive to good academic achievement but also one that is satisfying and enjoyable. (c) Teacher training rethought and restructured so as to provide experience in using these teaching techniques and in training others, such as aides or parents, to use them as well. (d) Special classes, if they are needed, restricted to the very young—the preschooler, kindergartener, or early primary grade children—before they become "failures."

Individualized behavioral instruction must become the pattern for all teaching.

As I see it, the most far-reaching implication of our work with problem children is that special education, or, more accurately, individualized behavioral instruction, must in the immediate future become the pattern for all teaching, and at the least, in the elementary grades. We would like to see each child in a regular elementary classroom working on his individual programs and responding enthusiastically to the materials, activities, and procedures that have been tailored for him.

We Have a Successful Tool Now—Let's Use It!

DAVID PHILLIPS

David Phillips has used behavior modification techniques with both institutionalized children and those who were only temporarily out of the public schools. In his presentation he emphasized that "there are some very good techniques for changing behavior available to teachers right now." These behavior modification procedures may not solve all of their problems of course, but Dr. Phillips feels that they will certainly improve the situation teachers are now in. These techniques "largely revolve around being precise with what you are doing: measuring, finding out what's going on right now, instituting some kind of change in procedure, and seeing what effect that has."

BEHAVIOR CAN BE CHANGED

☐ Although the specific techniques of recording vary a lot, the one thing they have in common is observing behavior over a period of time. I think that the important thing for the teacher to remember is that we can record data. It is imperative that we do so. We have to be precise if we are going to know the effect of our procedures and that, to me, is what teaching is all about. It is getting feedback from the kids so that we can adjust our procedures.

Teaching. . .is getting feedback from kids. . .adjusting our procedures.

As I see it, the big problem now is getting to teachers, to staffs of institutions, and so on, because ultimately those are the people who have to make the changes. We, as the people who use these techniques, have to be very convincing in showing that we can indeed change behavior in the direction we want. Once we start doing that, and can show people that we have something to offer, we can get a lot of teachers very excited about it.

PROCEDURAL PROBLEMS INSTITUTING BEHAVIOR MODIFICATION

☐ I want to relate what we have been doing with two different populations of kids, some of the procedures we have been using, and some of the problems we have been having. We have been working with public school educable mentally handicapped children—IQ roughly in the 50-70 range—and devising some programs ultimately to get these kids back into the mainstream of the public schools. Secondly, we have been working on a population of so called blind disturbed children who are institutionalized.

Prior training inhibits staff.

Our problems have been largely in the area of staff training and, secondly, in identifying reinforcers. With both groups our procedures have been pretty much the same. First, we try to interest the staff in doing something that differs a little bit from what they have been taught to do, which is to view the problems within the child rather than with their teaching strategies or materials. We've had an initial difficulty with both staffs. There's a lot of prior training that they've had which makes it difficult, in some cases, to come in and give them a new orientation unless they ask you to do so.

We can work with behavior precisely.

Our strategies for both groups have been similar—showing teachers that they can specify what it is the child should be doing or is doing that is of interest to them, getting the teachers to define the behavior precisely, and showing them that, indeed, we can work with behavior precisely. This is, in many cases, brand new to them, because they are usually trained in such a way that they want to deal in global sorts of ideas which do not lend themselves to action. So we have the problem of getting teachers to define what they are working with. We are talking about both social behaviors—how frequently does the child hit another child or whatever it may be—and academic problems—how many problems of a given kind can the child work in a minute?

Often the teachers of the mentally handicapped children we've been asked to help have been just a little bit reticent when we've tried to introduce these techniques. When we talk about counting how frequently kids do something, either academic problems or social behaviors, many of the teachers say that we're ignoring the real problems of the kids and just dealing with superficialities. And so we've had to be able to *demonstrate* to these teachers that we, indeed, have something to offer. We have not been able to work successfully with a teacher until we have been able to solve one of her problems. By and large, our most successful strategy has been to come in and ask the teacher, "What's bugging you most about this child?" and start right there. And if we could help the teacher with one problem with one child, for example, reduce the frequency of a social behavior which bothers the teacher in the classroom, then we could go on and get her cooperation and she would work with us and listen to what we had to say.

Solving behavior problems gets teacher cooperation.

STAFF PROBLEMS AT SCHOOL FOR BLIND DISTURBED

☐ With our blind disturbed population we have used a similar approach. We've had more difficulties with the staff in this population than in any other place I have ever seen. Many of them were very much opposed to the idea of our coming in and changing some of their old styles. They felt that their first obligation was simply to baby sit these people, to take care of them, to make sure they don't get hurt. They had no educational program at all. So the problem was fairly large. We had to get them to realize that these people can learn and change their behavior and that what really matters is what the staff does to get them to change their behavior.

Blind disturbed children can learn.

At the Hope School for the Multiply Handicapped in Springfield, Illinois, the head administrator was at first very biased against the term "behavior modification." He'd heard about it someplace, and he knew that it meant using cattle prods and so on to shape the behavior of kids. His frustration, however, led him to examine alternatives. The staff, and largely we're talking about cottage-parent supervisors, have a great deal of influence over the children. They control a lot of the reinforcers and punishers, and they were very hostile to our program.

What we have been trying to do is train the staff there to observe accurately. Many of the things we have to deal with first in this sort of population are reducing the frequency of certain behaviors which are self-destructive and increasing self-maintenance skills such as eating, dressing, and going to the bathroom. We need accurate data on how frequently these kids are doing various things under various conditions.

We need accurate data under various conditions.

Thus the problem at the Hope School centered on changing the behavior of the staff so that they, in turn, would diligently apply behavioral modification methods to the children. As with the teachers of the mentally handicapped, success first came when it was shown that the behavior modification methods really worked with the children and thus lessened some of the problems of the staff. Through the influence of the principal, new behavioral techniques began to be employed. The staff, however, often supplied unreliable data as shown by the introduction of a second observer.

The first problem is changing staff behavior.

This is probably our weakest area, getting in and showing the staff how to count behavior, and then, secondly, following up and making sure that they do it and don't just fake some data for us because we're asking. It's a problem we haven't solved, but it's a problem that is very real and important—changing the behavior of the staff and making sure that they are reliable and that they do not revert to their old ways as soon as we leave. We are just learning to cope with this problem now by showing these people that, indeed, we can specify behavior very precisely and that we can teach these children to do an awful lot of things important to them, things that it was formerly thought they were simply unable to do. We try to avoid the old cycle: "We know kids like that can't learn as much, so we teach less, and, sure enough, they conform to our expectation." And it's very convincing to many staff members.

GETTING RETARDED CHILDREN BACK IN SCHOOL

☐ With the educable mentally handicapped classes, also, it has been rather difficult in some cases to get teachers to religiously record this information about how frequently a certain behavior occurs. The same general principle holds. We need accurate information on what the kids are doing, so that we know if our procedures are having any effect.

Individualize procedures ...supply more powerful reinforcers.

Feeling that our objective is get these educable mentally handicapped children back in regular classrooms after we have accelerated their performance and changed their social behavior so that they would be acceptable to classroom teachers, we use the educational materials the kids are using in regular classes. In some cases when the problem presents itself and it seems that the regular material is not remediating, we may, on the spot, program something to try to cover that particular deficit. By and large, however, our remedial efforts have been in the area of supplying more powerful reinforcers, using positive contingencies to get their social behavior going, and then hitting the academic materials that are used at their appropriate age level in the classroom. Identifying potential reinforcers is often a new task for teachers. We came up with free time, snacks, games, classroom jobs, etc. Points were earned and exchanged for these rewards. What we are saying is that we are individualizing all of our procedures for each child. Ultimately, what will happen, I hope, is that all education will become special education.

Retrain special education teachers.

Many of the special education teachers we worked with had been very discouraged by their old practices. They wanted to change and be effective, but no one had ever shown them what to do. The training involved for these teachers has been to show them how to analyze the materials that are present, what kind of errors a child is making, how frequently he is making the error, and what to do about it. So in effect we have really had to retrain our special education teachers to use the behavior modification techniques.

In one case in a program in Prairie School in Urbana, we have faded all of our former "special educators" back into the regular school system. We now use these former special education teachers as tutors throughout the schools. We have a tutoring center set up where they see for 45 minutes a day any student in the school who is having academic problems. They see about 65 to 75 kids a day individually or in small groups. They simply put the kids on accelerating contingencies in the same material that they are working on in the classroom. But they also work on determining where the child is in terms of skill acquisition—what is the problem that is preventing him from going on? They keep data on the performance of the kids so that we know if a child is progressing or not. If not, then the question is, "What should we do about it?" What reinforcers do we need or what other kinds of problems are present that we are not coping with? In addition, the special education teachers have helped the regular classroom teachers keep similar record keeping systems. So the regular classroom teachers now are also able to identify when kids are balking and running down and what children are performing acceptably.

Special educators now tutor, aid classroom teachers.

In our Prairie School project we have taken all of our kids, who range from so called retarded, emotionally disturbed, socially maladjusted, and have first made their social behavior acceptable to the classroom teachers. Our initial attempts to return the children to the regular classroom were met with failure. We asked the teachers, "Could we get this kid back into your room? He's really doing pretty well now." And the usual response was, "No, I know—I heard about him. I know what a real problem he was, and I'd prefer not to take him."

Improve social behavior...

So we got fairly negative responses to these early attempts. What we did eventually was to fade the kids back in and find one teacher who would say, "Well, OK, I'll take him in for 15 minutes in art," and that's about it. And so we would say, "Great! Let's try it for 15 minutes today." And through just a fading procedure like this we have been able to get the children back into the regular classroom. The behaviors of all of the kids whom we have returned from special classes to regular classes have been acceptable to the classroom teachers. Not one of them has ever requested to get rid of any of these children again.

...gradually fade child back into regular program.

Right now, I think, when the techniques are available, it is imperative that we let people know that there are tools currently available to change the behavior of kids and that they're not so overly complex that it's going to take them years and years to understand how to use them.

Behavior changing tools are available now!

USE EXISITING RESOURCES TO MEASURE AND REINFORCE

☐ The next step after measurement is to talk about the kinds of changes that can be made in materials and specific procedural operations. How can the teacher provide different kinds of consequences for different kinds of behavior? In a public school, there should be resource people to provide advice. Some of the resource people who are there now, school psychologists, social workers, and so on, should be retrained. However, I think the probability of that happening is fairly low right now. Also, there is a need for people to help record data to help solve the time problem for the teacher. And again, people already in the schools could probably be retrained to do it.

Resource people should provide advice, help record data.

I think it is important to realize that after we have stressed the idea of measurement and recording, a very important step for the teacher follows. That is: what kinds of reinforcers or contingencies can we establish in the room? By and large, we don't really have to

COMMENT—I think your point brings out well the real need to develop some instructional packages that pull this kind of functional material together and supply it to teachers. I think the school districts just aren't going to buy another person *per se* to go in the school to do this as a resource person.

PHILLIPS—Yes, we need some sort of resource for people who in some way hear about these procedures and want to know what to do next.

COMMENT—I have one very specific suggestion along that line. We could urge that IMC centers have resource people who can suggest classroom relevant, alternative, reward and punishment procedures. IMC is a going operation, and you could just add it to each IMC center or train people now there.

PHILLIPS—I had wanted to talk here about what CEC might do to change some public school practices. Hopefully this is one step. But, as I think most of us are aware, you need to follow up a talk to a teacher. A one shot deal, in my experience, has been a real waste. So we need some ongoing contact with the staff we are trying to change. We've got to sample their behavior and see if, in fact, they are changing.

introduce many outside reinforcers, and that should allay the fears of many people about behavior modification. It is a matter of *restructuring* what the teacher has to work with in the room. Very often we are squandering reinforcers. In many cases it is simply changes of activities that are very powerful reinforcers to kids. In fact, just completing a task is typically a powerful reinforcer. If kids set some of their own objectives and meet them, there seems to be an acceleration in their rate of progress. Another important point is simply restructuring some of the materials so we are not asking kids to do things they can't do. In many cases, failure in school leads kids to engage in unacceptable behavior to get attention, creating rather than solving the problem. But the main thing I would like to emphasize again is that there is a lot that can be done right now that most teachers don't know about in terms of procedures.

Teachers tend to squander reinforcers.

QUESTION—What about the problem of some teachers wanting exceptional children to be in exceptional classes?

PHILLIPS—This is the traditional attitude. Teachers don't know what techniques to use to change the behavior of a child to make him acceptable, so they want him out of the room.

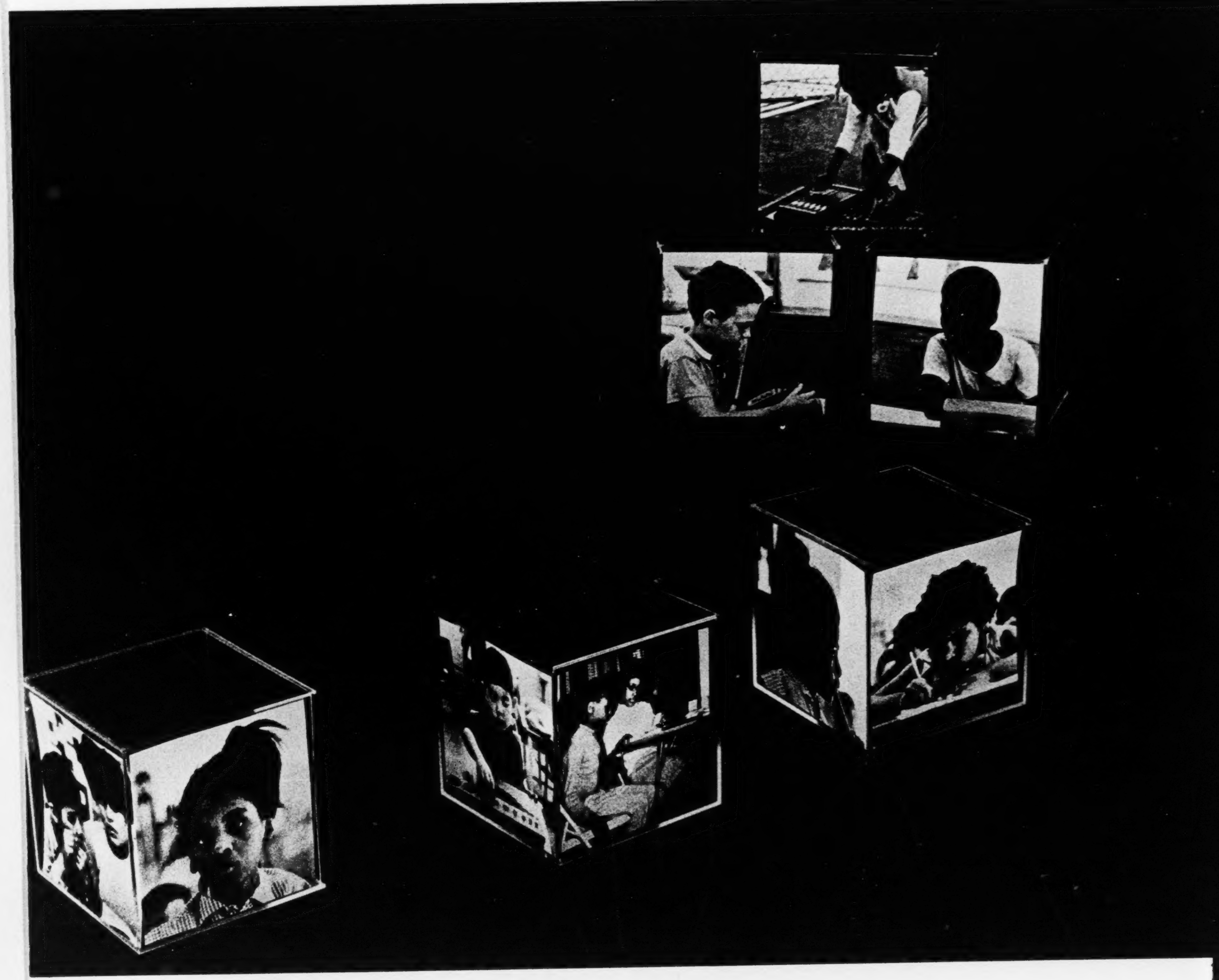
QUESTION—Do you have any evidence to show that these kids, if given proper remedial experiences, would not be a problem for the teacher? That would be very powerful.

PHILLIPS—In one school with which we are working, the teachers have taken any child we sent them and now, in fact, some request that we send problem kids to them. The program has really changed the attitude of a lot of teachers so they are no longer trying to get rid of these kids.

Precision Teaching Cuts across Cultural Lines

NANCY JOHNSON

Nancy Johnson directs Operation Upgrade, a tutorial project which uses precision teaching techniques to monitor the improvement in reading abilities of elementary school children. In addition to reporting on her own inner city work, Dr. Johnson presented the programs of two other people working with minority groups. David Giles works with Betty Hart and Montrose Wolf at the Southwest Indian Youth Center. Yvonne Tellez is a precision teacher trainer for the Unified Schools of Racine, Wisconsin. Dr. Johnson read and paraphrased from a manuscript sent her by Mr. Giles and played a tape submitted by Mrs. Tellez. Thus, in the presentation, three distinct, culturally different groups, black, Indian, and Chicano, were shown to benefit from the use of behavior analysis methods.



BEHAVIOR MODIFICATION IN THREE SETTINGS

□ In addition to telling you about my own Operation Upgrade, I would like to share with you some material given me by two people who are also doing important work. The first is David Giles who is working with our red brothers and, secondly, Yvonne Tellez who is working with our brown brothers.

DAVID GILES: AT THE INDIAN CENTER

□ David Giles describes the Southwest Indian Youth Center as an organization which works with young Indians, 14 to 20 years old, who have run into trouble. The residents are recommended by tribal judges and social workers. As of September 15, 1970, there were 33 trainees in residence and 25 staff members. Nineteen of the staff are from Indian communities, and the six who are not will phase themselves out as soon as the program is able to run smoothly.

Trainees receive instant feedback on appropriate behaviors.

According to Giles, both academic and vocational training—the majority of which is on the job experience—are offered. Cash rewards are provided for success in each. Incoming trainees and those who have experienced difficulty while at the center receive points (exchangeable for money) from the staff for appropriate behavior. The purpose of this system is to give trainees immediate and consistent feedback concerning which behaviors are appropriate and which are not. Discipline is a problem. Many of the trainees lack adaptive social repertoires when they are admitted. A graduated structure has evolved to help the trainees move from a position of dependency upon the staff to self-sufficiency.

Honor trainees earn free time, develop independence.

For example, a trainee who has become involved in difficulty on or off the center may be required to earn points or be made to post a monetary bond before leaving the center. When a trainee accumulates 5,000 points, he moves on to honor status which entitles him to a semiprivate room, pay for quality work in the vocational training program, and possibly free time in downtown Tucson. Thus, he gets more freedom to control his own behavior. Evaluations are no longer on a daily basis, and free time allows contact with many of the experiences that he would normally encounter in his home community. Free time serves not only as a reward for productive behavior but also as a probe of the effect of the program upon the trainee's behavior.

Giles indicates that evaluation is conducted in the following ways. Courtesy, care for equipment, etc. receive points. Swearing and aggression result in loss of points. Staff members evaluate honor trainees by checking whether or not they enjoyed their interaction with the trainee. There is objective measurement of social, vocational, and recreational behaviors. These data not only indicate the progress of the individual trainee but also reflect the progressive changes in the behavior of the trainees as a group. This helps the staff determine whether changes in the program are effective and suggests what manipulations might increase efficiency. The staff is also evaluated in the classroom; an observer records the frequency with which each instructor touches, assists, approves, or disapproves of each trainee. ☐

YVONNE TELLEZ: PRECISION TEACHING IN THE INNER CITY

I would like to share with you our initial experience in precision teaching. We introduced precision teaching as one of several services offered by the Title I program for teachers of the inner core elementary schools which have a high proportion of children from low income families who are considered educationally disadvantaged. The racial distribution in these schools is approximately 46 percent black, 38 percent white, and 14 percent Mexican-American.

Our children are considered "educationally disadvantaged."

Our teacher training class met weekly for approximately 15 weeks; several meetings were canceled to allow for individual conferences in each teacher's building. In addition to the meetings, I would visit the classroom and help the teachers teach the chart to the children and advise the teachers on their projects. For the first couple of classes, the teachers' reactions were less than enthusiastic. They initially wanted to talk about their deviant children and wanted me to give them solutions on how to change their children's behaviors. After a couple of meetings, the teachers finally realized that I would not give them solutions to their problems, but they would learn the principles of precision teaching and how to use the daily behavior chart. Then they would be able to come up with their own behavior change procedures. They would, thus, become their own behavior modification experts.

Teachers become experts in changing deviant behavior.

Initially, many thought that the system was too complex and that the chart was too difficult to understand. There were a couple of swinging teachers, however, who were intrigued with the chart and could see how it would help their kids. It's funny, but the complaining began to extinguish once the teachers became actively involved in counting behaviors and putting rates on the chart. Needless to say, this taught me a lesson. And now, for this semester's class, I have the teachers counting behaviors and learning how to chart by the second meeting.

Once the teachers began to show the children the chart and, in most cases, teach the children the chart, they found how really simple the system was, and they became much more positive. They were really surprised at how readily the children took to the chart and how eager they were to see where their dots would be charted each day. Some teachers commented in class that the children would always remind them to have their performance counted so they could see whether they were improving or not. One teacher said she had to include more children in her charting, because the children would nag her so they could have their own charts. Five teachers decided to use the chart with their entire class in at least one subject area.

Children's enthusiasm 'sells' charting to teachers.

If there was any one factor that sold precision teaching, it was the children's reactions to the chart and in most cases their subsequent behavior changes. As we say, "The child knows best." One teacher commented that her initial reaction was very negative. She saw the system as being too rigid and much too complex for her first graders to understand. But now she sees that it really helps her to be a better teacher and helps her children learn more and in a much more efficient manner. A remedial math teacher recently told me that her children love to have their basic facts counted and charted and that this has been the best motivation for her class and the best thing that she has tried all year.

Keep them charting!

As for the future of precision teaching in the Racine schools, we are not sure whether Title I will be able to offer the course to the teachers next year, but the situation looks pretty good, and we probably will continue. In fact, there is some talk about using precision teaching in the special education classes. Last, but not least, I would like to give credit to the beautiful people who have helped me learn about precision teaching and have given me moral and professional support in my first year as a trainer. I would like to thank the Starlins, Ann and Clay, who have patiently given me many hours of their time; Nancy Johnson; and, of course, Dr. Lindsley who first introduced me to precision teaching. Thank you for your time, and keep them charting.

OPERATION UPGRADE: A COMMUNITY PROJECT

☐ Operation Upgrade is part of the Kansas City Model Cities Program; however, it began and remains a far less formal operation than either the Indian Youth Center or the Precision Teacher Training Program. Operation Upgrade began in 1968 as a tutoring project in a church basement. There were only five tutors and 25 children. First we called it "The Thing in the Basement," but we wanted government money, so we had to go upstairs and call it something respectable.

Operation Upgrade fills the gap between Headstart and programs for teenagers, like Youth Corps and dropout programs. It serves children in grades 2 through 6, before they get so behind in their work or so discouraged that they become potential dropouts.

Reading...the key to academic success.

Operation Upgrade deals exclusively with reading, the key to academic success. The children who enter the program are a year or more behind in reading, and they are kept in the program until they read competently at or above grade level.

COMMUNITY PARAPROFESSIONALS USE PRECISION TEACHING

☐ Nine tutoring locations staffed by 57 tutors and nine program directors serve 270 children, and there are 1,453 on the waiting list. Each tutoring center, which might be in a model city neighborhood area headquarters, school, or home, serves approximately 30 children. The tutors are teenagers attending inner city high schools, and they spend 45 minutes a day, 5 days a week on a one to one basis with the children. Ladies from the neighborhood, some of whom don't even have high school degrees, work as program directors.

There are at least two important reasons for putting precision teaching procedures in the hands of people in the community. If this tool is any good at all, anybody should be able to use it. It should not be reserved for those in academia. Secondly, there is a very large number of children who need help. There are so many that we must get other people involved: the high school kids who tutor, the family, radio stations, and so on. They get excited, and that way we can help each other.

Precision teaching should not be reserved for those in academia.

Precision teaching is the tool for insuring reading improvement in Operation Upgrade. The tutors keep the daily performance rate of correct and wrong responses for each child on at least nine reading movements: reading from a graded reader, from a newspaper, from stories written by their peers, and from their own stories; answering comprehension questions; writing their own stories; and so on. The tutor works with the children, helping them over rough spots and making sure they experience some success.

FORMAL CONTINGENCIES TRIED, THEN DROPPED

☐ We make sure the materials are such that each child is given a real learning opportunity. Although formal contingencies were tried, they are no longer used. We started with candy and then went to points that bought toys. But that brought two kinds of trouble. Kids would cry, and parents would call up and say, "Luther made 15 points today, and Beulah only made four. What are you doing?" The second deterent was that the children were comparing and competing with each other instead of looking at their charts and saying, "Where was I, and where am I now?" The use of points has been dropped.

Instead of a point system, the tutor works out the student's mistakes with him and uses only the charts as reinforcers. Formal contingencies are used for the tutors, however. I give awards to the top tutor-pupil combination, and when a tutor asks, "What do you have to do to get that award?", I say, "The kid has to get better."

The aim is always to do better.

When I found that there was a higher percentage of students decelerating on error than improving, I spoke to the tutors about changing their emphasis. The aim is always to do better, better than the week before or the day before. "Hit that correct!", I told them, and it reversed itself. Instead of saying, "No, that's wrong," say "Almost, but try this," and the child's behavior changes.

VARIETY OF READING MATERIALS

☐ The variety of reading materials used by Operation Upgrade is important. Acceleration analysis allows the directors to pick which reading activity provides the best opportunity for each child to learn.

What I have found, and what people often don't like to believe, is that children can learn just as much just as quickly from the *Kansas City Star* or from stories written by their peers as they can from publisher prepared, behind the desk material (Figures 1 and 2).

Children usually read their own stories faster and at a higher rate of accuracy than they can read any other material. Thus, this rate can be used as a target for their reading of other materials. The children's stories are then collected in a package called "Our Stories"

Figure 1. Graded Reader

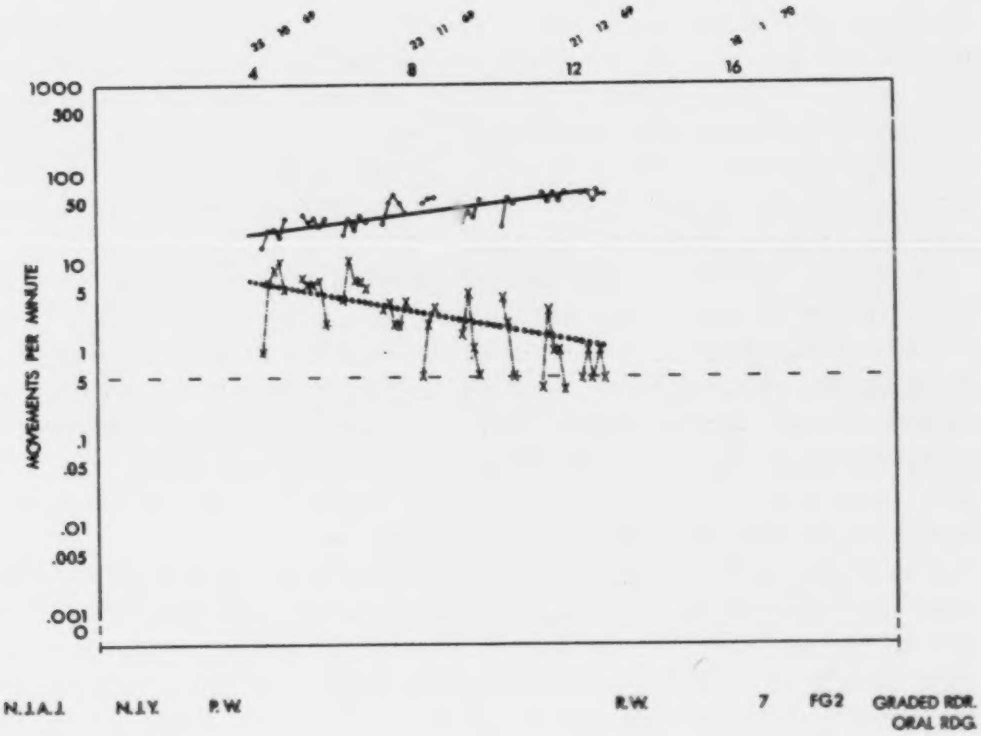
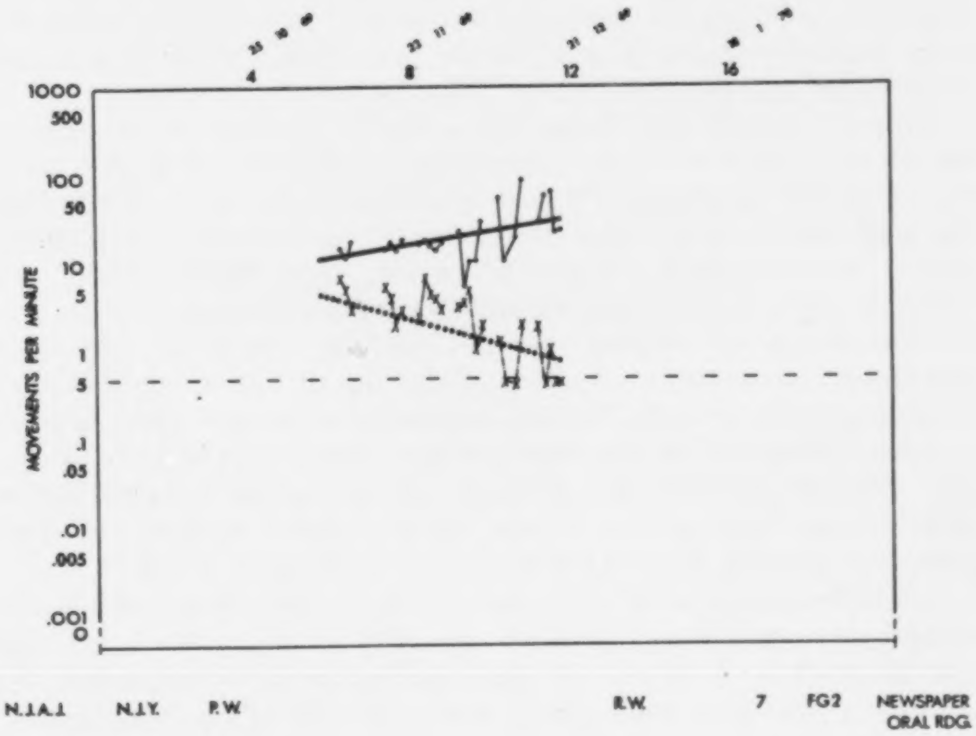


Figure 2. Newspaper



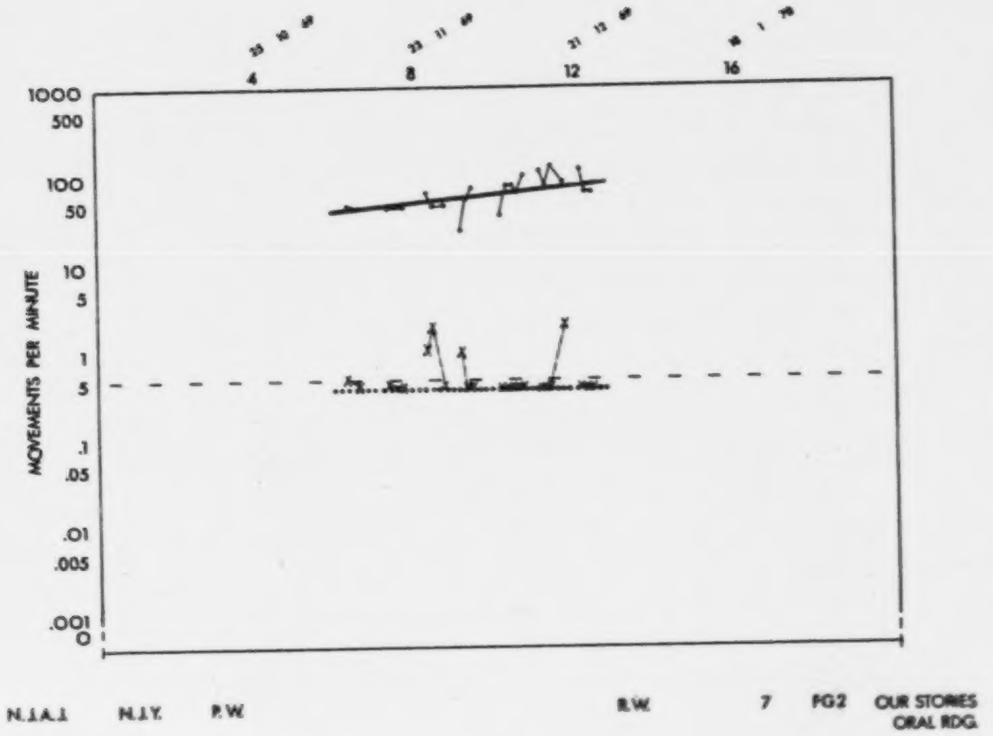


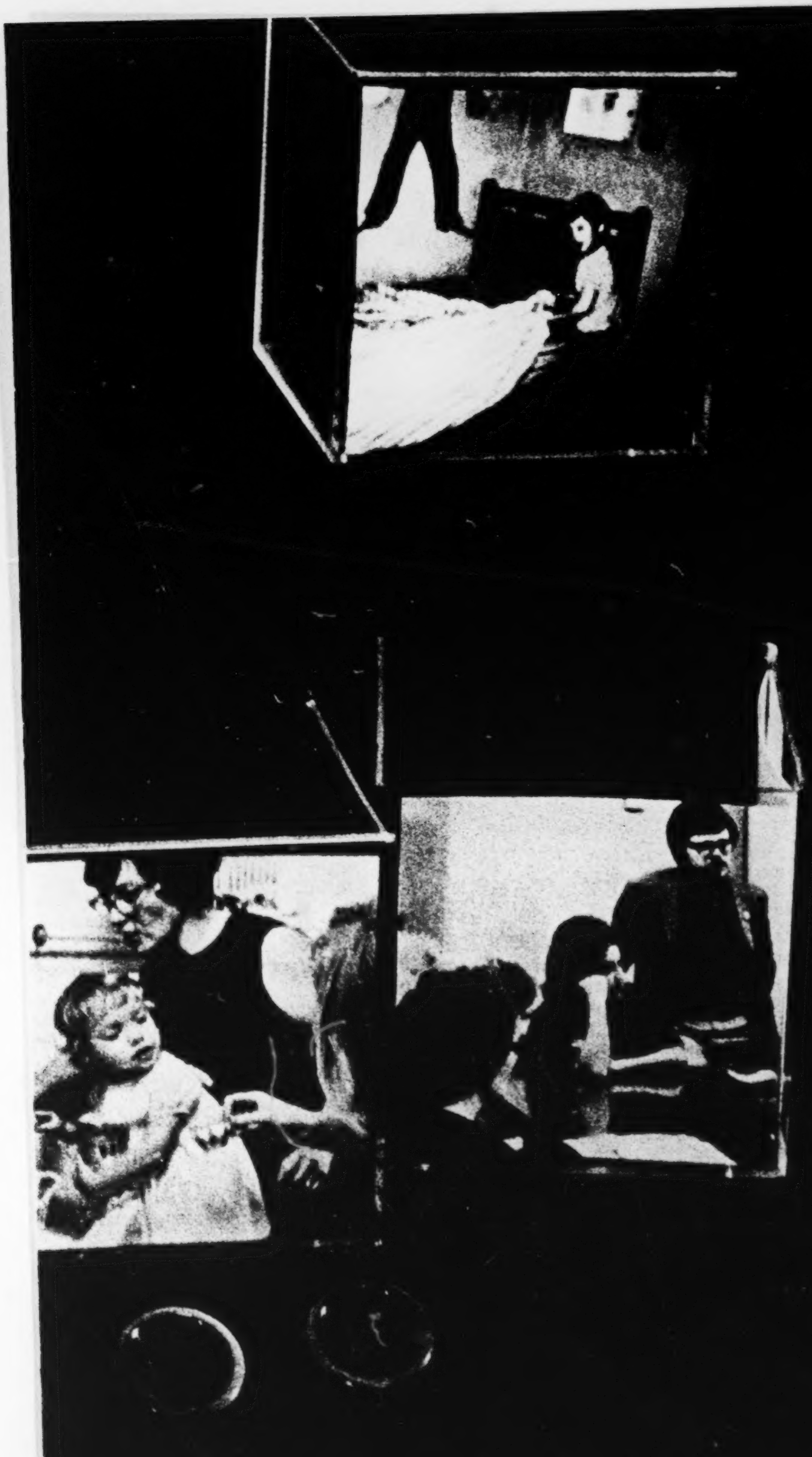
Figure 3. Our Stories

and sent to all locations as additional reading material (Figures 1 and 3).

COMMUNITY INVOLVEMENT MEANS SUCCESS

☐ Although many people, particularly professional educators, have said that paraprofessionals cannot handle children properly and cannot teach successfully, this community program works. And it works so well that Operation Upgrade receives many referrals from the school system. I attribute this success to the involvement of the community, these "paraprofessional" high school tutors, and neighborhood program directors. In community work, the more people who get involved and feel they are contributing, the more successful the program will be.

Charles and Kay Galloway are currently working for the Eastern Nebraska Community Office of Retardation (ENCOR), a program of integrated services for retarded people in Omaha. Believing that "there is no such thing as exceptional children, only children in exceptional predicaments," the organizers of ENCOR try to normalize the environment and behavior of the retarded as much as possible. This includes integrating them in the community and keeping retarded children at home with their families. In his presentation, Dr. Galloway concentrated on the need for and successful procedures of parent-teacher groups in which precision teaching techniques and charts provide the means of communication between home and school. To the Galloways, the most exciting aspect of these groups is the spirit of cooperation and the practical advice parents share with one another.



Precision Parents and the Development of Retarded Behavior

CHARLES GALLOWAY

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THE COMMUNITY SETTING

☐ I would like to tell you a little about the community system in which Kay Galloway and I are operating and then go into specific strategies that we want to work out within this system.

Our interest and activity for the last several years has been in the area of retardation. Retarded folk are the most culturally excluded group we have. As far as segregation, isolation, and restriction from community involvement is concerned, people who are retarded have been oppressed to a very great degree.

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This analysis attracted me to a new service program developing in Omaha. This delivery system is called the Eastern Nebraska Community Office of Retardation—more simply, ENCOR. The local parent association for retarded children—or retarded citizens—decided to propose a wide ranging, comprehensive plan for all retarded people in their area starting with the county in which Omaha is located. They decided that institutions were no longer to be tolerated as alternatives of service for retarded individuals. They wanted a complete turn-around, conceptually and pragmatically, as far as these services go. Thanks to professionals like Wolf Wolfensberger and Frank Menolacino, they developed the plan for ENCOR. But it took a lot of parents and a lot of nonprofessionals to produce the kind of service that is just now beginning to get into full swing and to grow.

Institutions were no longer to be tolerated as alternatives of services for retarded individuals.

ENCOR attempts to integrate under one administrative agency as many types of generic services for retarded people as possible, that is, not having one agency that provides residential services and another one that provides vocational training and still another one for developmental education for the younger kids. There is a range of services planned to go from maximum medical supervision within a hospital setting for those people who need that kind of supervision, to service for those people who are totally independent except for needing a little bit of support once in awhile from a friend.

My job is to direct the developmental and educational service program and try to integrate it with the others. Presently that means supervising six developmental centers serving about 140 children. We hope to keep creating small developmental centers whenever the need arises. Presently ENCOR is serving a five county region in eastern Nebraska which includes about 34 percent of the state's population, both urban and rural areas.

The overriding principle that dictates how these programs are designed is the one elaborated best in the United States by Wolf Wolfensberger. It is called "The Principle of Normalization." Whenever we try to conceive a new type of service or a new way to improve the services that we have, we always ask the question, "Is this the way it would be done normally?" Is this a normal means for training? Is this a normal behavior that we are trying to help the people acquire? Is this a normal setting in which to do this work?

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THE DEVELOPMENTAL PROGRAM—A PREP SCHOOL

☐ When people ask about the developmental program, we tell them it is a prep school, rather than a finishing school for the children's education. We have a heavy educational orientation, but we have to take a lot of our objectives, our instructional objectives, from other systems. What does the average program for the trainable mentally retarded require of entering kids? Why do they bounce our kids out? What do we have to do to get them back in? What does a work activity center in vocational training require an individual to do mentally in order to accept him? Our job is to prepare people, to smooth their transition into other systems. So we shouldn't be keeping kids year after year. The longer we keep a kid, the greater the indictment of our work. It's the same below us. There are people who aren't even ready for our programs, for example, a mentally retarded youngster who has spent the last 10 years in an institution and bangs his head all day. We can't cope with a kid like that within the developmental school setting. Consequently, we have established a behavior modification unit in the community to serve the needs of these people, to prepare them for the prep school.

Our job is to prepare people, to smooth their transition into other systems.

These Developmental Centers or prep schools are to be no larger than 25 to 30 kids and have one head teacher, three teachers, three assistant teachers, and some other supporting staff. The centers can be placed in churches or in any sort of building that we might lease and renovate. The ages of the children range from 2 1/2 to 16 years. Most of them are in the 6 to 12 year old bracket. When they become 16, they can go into vocational training if they are not already in some regular educational program.

In institutions good staff might get kids shaped up, and where did they go? Into another building maybe. Now, that's an awful thing to look forward to in life, to graduate a kid from one institutional building to the next. It is much freer now with this community system than it ever could be in an institution. We feel this is the way services ought to be provided for all "deviant" people—in terms of normal standards. Whether children are emotionally disturbed, retarded, physically handicapped, or whatever, all helping agencies should apply the principle of normalization.

Whatever the disability, the principle of normalization should apply to all helping agencies.

What do we need to do now in this scattered school system of small centers? Obviously, we need to train teachers and work with them. The next thing is to start working with parents. That is what I would now like to describe—training parents to be precision parents.

BRINGING PARENTS AND TEACHERS TOGETHER

☐ Here are some strategies from our work that will help lead us in the future. The first one is the overall strategy probably of any work with retarded kids, that is, to keep the child in the community and to preclude the separation of a child from his natural family. There are times when it may be advisable to separate the child from his family, but in the main I think it is better to leave him with his family and to help that family adjust to the child and then to help the child when he is an adult.

It is better to leave the child with his family and to help that family adjust to the child.

To force parents to choose between the alternatives of keeping a child who is unmanageable at home or sending him to the institution is grim. For many, many parents of retarded children, those are the only two choices that they have. To send their child into an institution is an awesome decision for parents. So our overall purpose in working with parents is to try to preclude this separation. To do this, we hope to extend the education of the child into the home, broaden his education day so that it is not just four or five hours in a developmental center. One purpose of this strategy is to avoid the weekend regression, or the Monday disaster, that so many teachers of retarded youngsters have experienced. The teachers work all week getting things kind of perked up and are doing pretty well on Friday. The next Monday they have to start all over again. If the parents can share the educational ideas and procedures that the teachers have, they can extend these procedures into their home and do some of the maintenance work that is often required of the teacher.

We hope to extend the education of the child into the home... to broaden his education day.

We would like to help the parents become more self-sufficient. That means less reliant on folks like us. We want to teach them how to solve problems, not just how to name them, to help them learn the tools those of us here share so that they can apply them in their own creative, unique ways to their own unique problems. I think that's our job as professionals—to teach people how to use tools, not to be a crutch for society.

Our job as professionals is to teach people how to use tools, not to be a crutch for society.

Also, we learned that parents have a lot to tell teachers but that there is often no real means of communication. The old parent-teacher conference, where you share anecdotes or bring your sensitivities together, where the parent is defensive of the child and the teacher is defensive of her effectiveness, is a bad setting in which to try to figure out the best plan for a child. We need some way for the parents to be able to tell the teacher what they know that could help the child in school. Questions like, "What does Johnny like to do? I haven't been able to find anything at school that could serve as a reinforcing consequence for this child. What do you think?"

A big step in behavior management is asking the question: What does he like to do? What would be an effective consequence?

We had a very nice example of this kind of communication that is one of my favorite anecdotes. There was a child in the day care center whose mother was trying to get him to brush his teeth more. He would avoid the bathroom. It was like going into a forest fire for him. He'd go in kicking and screaming. But once you get people ready to ask the question, "What does he like to do? What would he go in there for?", that's a big step in the direction of better behavior management. The mother thought and said, "Well, the only thing I can think of that he really likes to do is stay in the kitchen and watch the electric mixer when it is in operation." There was something about the vibration and the noise that would just fascinate the kid. It was better than TV. So it was obvious: put a mixer in the bathroom. Turn it on when he puts the toothbrush in his hand, and then work the toothbrush up into his mouth. So she did it. That was something that the mother knew that the teacher would never have guessed. And I certainly wouldn't have guessed it. It may not work with any other child on this earth, but for that child it was a very effective consequence. What was even more exciting was when another mother scratched her head and said, "You know, if he likes the mixer so much—I've got an electric toothbrush at home." So you could put the motion in his mouth where we want the action anyway. The electric toothbrush was brought and shared with the first mother. When you can see parents communicating like that and getting away from the feeling, "Oh, I've got a retarded kid and woe is me," then you know you're making progress.

Parents have been beaten down for so long because their problems have not been solved by the professionals, and no one has told them how to do it themselves. In fact, most professionals have told them that it can't be done anyway. So they have every reason to be distressed and depressed and ready to put the kid away someplace. We want parents to be able to say, "Here is a problem developing; we had better take care of it now." For example, the kid just hit himself. Uhoh. Instead of waiting until two years later when the child is a 400 a minute headbanger and taking him into the institution, the parents can work with him when he is doing it two or three times a day. The parents have to know how to handle these problems, the potentially dangerous behaviors that should be brought under control immediately while the rate is low.

Parents have to learn how to recognize the potentially dangerous behaviors that should be controlled immediately.

In a very long range sense, we believe that parents, through this kind of work, can make contributions to the whole field of education. We don't really have exceptional children; we have children in exceptional predicaments. It is the predicament that makes them stand out. We have to change the predicaments to make these kids less exceptional. Those are our broad objectives.

We have to change their predicaments to make these kids less exceptional.

GETTING A PARENT GROUP GOING

☐ Let me now go over some of the things we think are very helpful as prerequisites to getting a parent group going. Some of these things we have learned the hard way. Our overall strategy calls for parents and teachers working together, not separately, not having the parent group be independent of the teacher. We also believe that it is important for this cooperation to operate physically from within an educational setting, to bring parents into a setting that says "education." We want them to get used to coming and working with teachers where the children spend their day. Here I am talking mainly to trainers—it is very helpful if the parents have a history of coming to the school or developmental center for meetings in groups for some time before you start specifically talking about precision teaching.

Our overall strategy calls for parents and teachers working together, not separately.

Secondly, although we are at first responsible for bringing the parents and teachers together in this setting and with this purpose, we emphasize our fading out as soon as possible. We want to shift the

TRAINING PARENTS TO BE PRECISION PARENTS

To convey a feeling for the interaction among teachers and parents, Dr. Galloway asked two of the conference participants to join him in a role playing situation. This little drama captures the spirit of cooperation and sharing among parents which first impressed the Galloways. "In the skit I tried to capture some of the things that Kay Galloway and I observed in our previous work with parents in and around Nashville. Working with parents and teachers at the same time excited us so much it became one of our major professional strategies."

TEACHER - Mr. Farentino, we'll start with you tonight. Last week you decided that Tony's rate of buttoning large coat buttons was high enough that he should move to practicing with smaller buttons. I made that same change here at the center. I would like to share our chart with you if we could see your chart from home first.

TONY'S FATHER - Well, it seems we made the wrong decision. Tony had a lot of trouble with regular buttons. See? His rate dropped to about 3 or 4 a minute and he was very upset while he was practicing. By the end of the week, he just wouldn't practice at all. Do you think the small buttons made him frustrated or anxious?

TEACHER - Well, Mrs. Thompson, you have been through all this before. Can you give us any ideas?

ARNOLD'S MOTHER - When we went through this business with Arnold, about a year ago it was, his rate fell when he went from the coat buttons to the regular shirt buttons, but it picked up in a few days, and he did just fine in a couple of weeks. Of course, we did work a lot on it. I mean, I just worked every night. Now, Mr. Farentino, how was it again that you had Tony buttoning the big coat buttons?

TONY'S FATHER - Okay, I'll go through it again. We put the coat on the floor—with the buttons up, naturally. Tony got down on his knees next to the coat and worked from the bottom of the coat up. Okay? When he got to the top, his mother and I clapped and praised him. He laughed a lot, and we did the whole thing over again for 10 minutes.

ARNOLD'S MOTHER - And you went from that to having him button the shirt he was wearing?

SETTING — Imagine a church basement or annex, a space usually designed for a Sunday School or nursery and not normally used too much except on weekends. For the last year, this basement has been used during the week as a developmental day care center for retarded children. So mentally add some balance beams, big toys, and little chairs and tables. It is night time and there are about 25 adults sitting around the room. Imagine them to be of all types, some older, some younger, some more affluent looking, some less so. It's just a kind of cross section of the surrounding community. Imagine also a few teachers and assistant teachers and a couple of advisors in the group. The total group is divided into about three little subgroups sitting around tables with everyone talking at once. There is a kind of din you should conjure up in your mind. You might even imagine coffee brewing, because there usually is.

TONY'S FATHER - Yes.

ARNOLD'S MOTHER - Oh, that's probably the answer. When we did it with Arnold, he was wearing the coat.

TEACHER - Of course, Mr. Farentino. Why didn't we think of that?

TONY's FATHER - Okay, I'll draw another line on the chart and this week we'll practice him with his coat on. It looks like the last week was a waste of time.

TEACHER - Oh, I don't think so at all. If Tony had been able to make the change without so much trouble, you'd have saved a lot of time. You have to try in order to find out. And now you'll have to...

TONY'S FATHER - I know, I know—try, try again.

TEACHER - Mrs. Thompson, next week would you remember to bring in your buttoning chart on Arnold. Maybe we could get an idea from it about how high a rate Mr. Farentino should aim for when Tony buttons his coat while wearing it.

leadership to the teachers so that they are the functional leaders. If they have been trained well, teachers are better than most people in developing educational procedures for the children. So the teachers should be the ones to lead the parents, make suggestions, and work with them rather than the group's relying on some outside personnel to hold the whole thing together. We want durable parent groups. We want parents coming in regularly, working with the teachers on the educational development of their children.

Teachers must be comfortable with the behavior approach and able to interpret and plan changes from the charts.

In order to make teacher leadership successful, the teacher must already be comfortable with the basics of precision teaching and the behavior approach to education. And most importantly, the teacher must be able to interpret the records. Most of us grew up with this; we automatically make our projections on the basis of the charts and make decisions accordingly. I have made a lot of mistakes by not emphasizing to teachers that these charts are not for historical purposes only. They should see the charts as something that says, "Now is the time to make a change," or "You're really doing great!" I think in the past we've let people think this was a historical document and that was all it was useful for.

Don't train teachers and parents at the same time.

Teachers, then, must be able to lead the parents in such a way that they are able to interpret the charts, too, and be confident of their decisions. So the conclusion is, if at all avoidable, don't train the teachers and the parents at the same time. You can imagine what you're doing to the teacher who sits down with a group of parents who are asking her questions, and she has to come off like a dummy. How could we ever have expected her to be enthusiastic under that kind of threat? Also, you decrease the likelihood that the group is going to be durable if the leaders are not confident with what they are doing. So in our Omaha project we are waiting until the teachers are very confident of what they're doing. Parent classes may be as much as a year away, but I would rather wait and do it right than hustle it now and destroy it for the future.

As a transitional measure, I think it is very helpful to have the center decorated with charts—all over the place—so that when the parents come in to pick up their kids, they grow used to seeing them. Anything that will reduce their shock when you show that first transparency to them. If they have never seen charts before, it can be a very scary thing. What is that peculiar thing? But if it is part of the normal tools of the teacher—and give it all the normalcy you can—it is less of a shock. Make sure the teachers are saying, "Look how he did today!" "Isn't that great!", casually showing the parents the charts.

A good thing when you do start your parent meetings is to begin by giving the parents some kind of broad picture of what you're trying to do. Share with them your ideology of education and philosophy about exceptional children. Share with them your optimism

Share with parents your optimism about their children's potential.

about the children and their potential rather than allowing them to think that you might also share other professionals' pessimism about their children's potential. Optimism is a very important component. For those of us who came up through operant conditioning, it was just part of our growth, and we have to share that with the parents.

One kind of analogy that seems to strike home with parents and make them a little more hopeful is the model of the jigsaw puzzle. The normal child's development is like a big puzzle, a puzzle with larger pieces than that of the retarded child. The normal child's development comes in bigger chunks which are easier to put in; it is more obvious how they fit together. Sometimes the kid will develop almost in spite of the teacher. But for the retarded child, development is like a monstrous jigsaw puzzle with a lot of tiny pieces. It is slower to put those pieces together even if you know where they go. Often, however, we don't even know where the pieces are. Some people think they are in a locked box called genetics, and others in the neurology of the child or in the history of the child's family. Many people think that some of these pieces are totally and forever locked up. We don't know how many of them we really can find. It is simply a bigger challenge to our intellects to figure out how to educate slow learners or retarded children than it is to teach the normal, but the process is essentially the same. At least this kind of analogy gives the idea that the puzzle *can be* put together.

For the retarded child, development is like a monstrous jigsaw puzzle with a lot of tiny pieces...

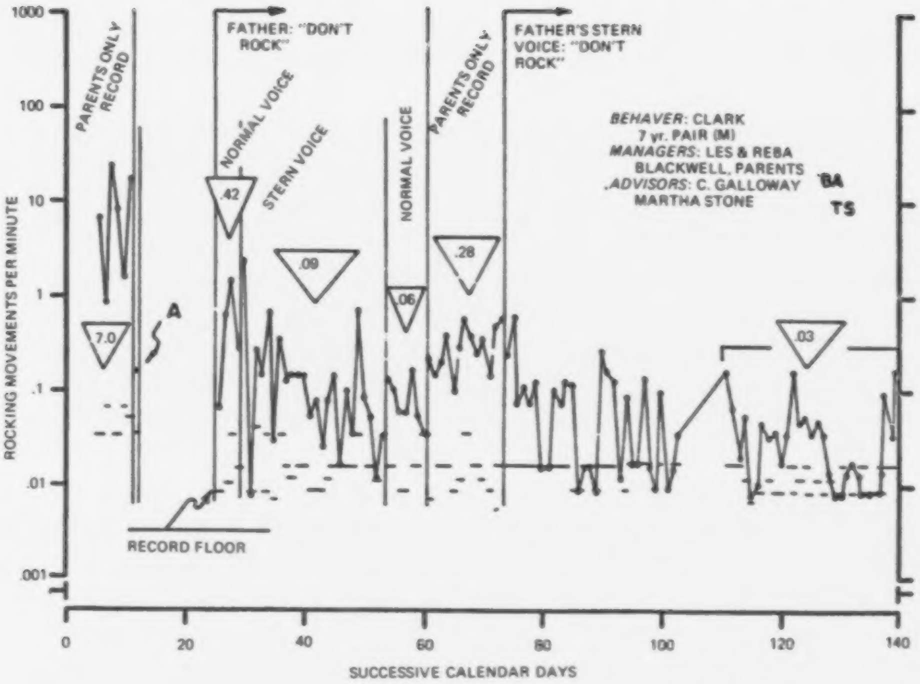
...but they can be put together.

After this kind of general introduction, we usually try to spend about three or four meetings on didactic kinds of instruction using the overhead projector and giving practice in charting. After that, it's a matter of getting the parents and teachers together and just working on their procedural problems rather than the mechanics of charting and planning. Once that gets rolling, it can be very exciting. They ask each other, "What do you think? What would work here?" If they are totally without answers or ideas, you can offer a hypothesis. But as likely as not, their ideas are going to be better than yours once they know how to manipulate the conceptual tools to arrive at those decisions. One thing you want to avoid is getting in a position where they expect you to answer every procedural question they ask. At this point, the professional should stay as much in the background as possible.

A SUCCESS STORY

☐ Let me show you my favorite chart. It represents the work parents and teachers did with a 7 year old PKU child, Clark Blackwell (Figure 1). He was a rocker. In the first parent group we ever worked with, Clark's father brought up the issue of his son's rocking and wanted to know what caused it. I didn't know and didn't care really. We got around that, and he went home and counted Clark's rocking—about seven times a minute. He came back the next meeting and said, "OK, I've counted—now what do I do about it?" Secretly I was thinking, "Maybe it *is* brain damage. It's nice to have the parents

Figure 1. Decelerating Clark's Rocking



start off with success, and if he's going to get into this brain damage stuff, I'm going to be in real trouble." Drawing on my extensive training, I suggested that Clark be physically held to prevent his rocking and then rewarded with a piece of chocolate. "A" on the chart marks what happened the only day he tried it. But that doesn't reflect the behavioral disruption that *my* procedure produced. He wasn't rocking, but he was climbing the wall instead. So the outcome of my prescription was worse than the original complaint. This frustrated the father to no end, so he didn't come back, and for a while there's no charting.

The outcome of my prescription was worse than the original complaint.

But he finally did come back, and we tried again. He tried something neither of us had thought of at first. He just told Clark not to rock, as a consequence, and there is a steady slow decline in the rocking. But the father wanted better progress, so he got a little more stern. He'd take Clark by the arm once in a while for emphasis, and the rocking came down and leveled off to about six times in 100 minutes as opposed to the initial rate of seven times in one minute. The consequence worked.

After a great deal of persuasion, we talked Clark's father into removing the consequence and just recording. He was loathe to stop with all his success. "What if it comes right back up again?" he said.

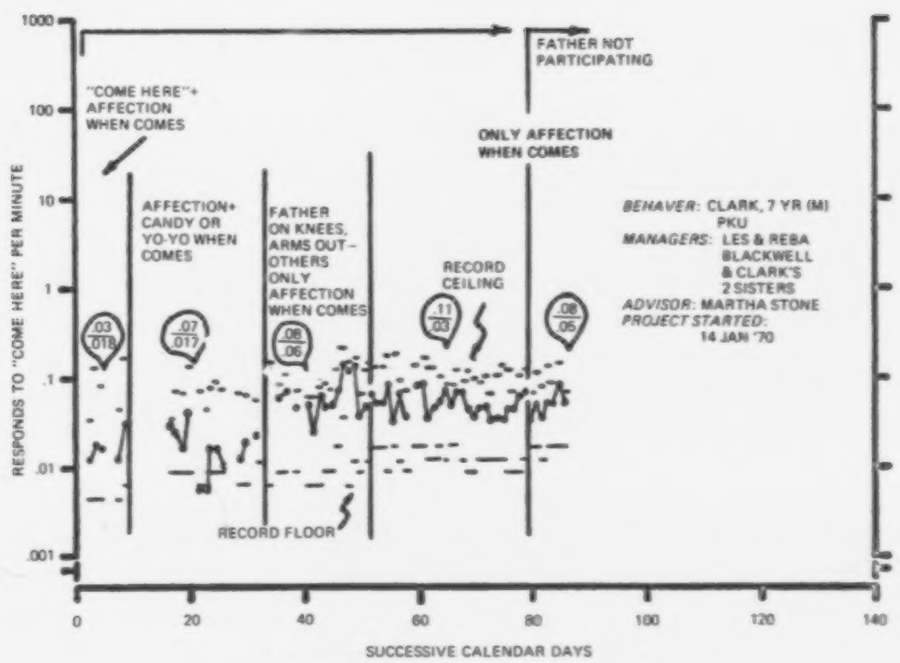


Figure 2. Accelerating Clark's Coming When Called

The answer is, of course, that if you got the behavior down once, you can do it again. So he tried it, and as the chart indicates, there was a trend toward the original rate, a raise in rate. The beauty, I think, of this kind of charting is that you don't need to go all the way back to the original rate to know you've made a mistake. There is a very clear trend. Without the chart, just judging from day to day, we might have said everything was OK. But by looking at a series of records like this, you can see the highs and lows and know enough not just to chalk it up to a bad day or a good day. Overall it looks like it's going up. So the child's father can—and did—make a decision. He reinstated the stern command whenever he saw Clark rock.

The beauty of this kind of charting is that you don't need to go all the way back to the original condition to know you've made a mistake.

Clark's parents were so excited by this particular project that they went on to another chart. The nice thing to see happen is that they went from encouraging deceleration of a problem behavior to acceleration of a desirable action. This second chart is a little more complicated, but they are also more sophisticated now with the method. Here they are trying to teach Clark to come to them when they call him (Figure 2). It is very scary for parents not to have a verbal string on a child as a safety device. Briefly, the family tried various methods. Normally, when Clark would come when called, they would hug him. That was a baseline or "before phase" and

It is very scary for parents not to have a verbal string on a child as a safety device.

affection was the consequence for responding. And that stays in effect all the way through. Next they selected either candy or playing with a yoyo as a consequence. When you call the child, you are in competition with something that is drawing him away, so you try to find a powerful reinforcer. These two choices, as the chart shows, were not powerful enough.

One night, just accidentally, Clark's father found the right consequence. He called to Clark, fell on his knees, and held his arms out. Clark came dashing over. The next section on the chart represents Clark's progress using this maneuver as a consequence. You can see the improvement. Next they went back to just affection, and Clark's response rate seemed to be better than when they started out. After that, Clark's father decided to subtract out his part in this procedure and run his own chart himself, letting the rest of the family continue this chart themselves. If anything, the behavior seems to improve. Maybe the father needed to work individually to find out, for example, whether his affection was equal as a consequence to the rest of the family's affection.

It is exciting when parents move from deceleration concerns to "What does the child need to learn?"

What is particularly exciting is this situation with Clark and his family is that the parents started out with deceleration concerns and then moved into what the child needs to know or accelerate. What does he need to learn? That's the point when you are really in tune with the school. Often the deceleration concerns (like Clark's rocking) aren't necessarily the problems in school. What you want to develop is a situation where the parents are working on a comparable pinpoint. Parents can discover things at home that can help the teacher and vice versa. So often the pinpoints that the teachers are working on are of particular interest to the parents of low functioning kids, because the teachers are working on self-help skills and social behavior or preacademic kinds of things which should facilitate the child's being a real part of the family at home.

Active cooperation between parents and teachers can help guarantee the child's place in the family.

A lot of things teachers in these programs are working on can give the parents more mobility. The child who can button himself up is less trouble than the kid you have to struggle with to get his shirt on. I didn't quite understand until I started working with parents that the lack of something like toilet training can be a social anchor. You can never go out of the house without having a baby sitter. Do you want to take the child to a restaurant? Can't do it. To a movie? Can't do it. So over a time, the whole social world of the parents becomes smaller and smaller until it centers around the TV set, and that's it. So cooperation—active cooperation—between parents and teachers is extremely important. Working together, they can help guarantee the child's place in the family and the family's normal functioning as well.

QUESTION—This may be kind of obvious, but what do you do with the parents who don't care? Do you have some techniques or methods for that?

GALLOWAY—I'm not trying to delude myself by saying that this particular structure is going to work for all parents. There are obviously some parents who just send a child off for day care to get him off their backs. You have to work on that on an individual basis—go into the homes, counsel, you might even threaten. There is a need sometimes to sit and talk about the parents' problems before you get to the kids—but not as often as clinicians think. There is a kind of dogma that parents have to work out their feelings about and accept the child before they can work with him. We find, on the other hand, that parents are often more accepting of their children and feel better about them when they can manage them better. So it is the other way around.

COMMENT—We're working with the Parents and Teachers Association for the Retarded in New York City, and we have been finding "spillover effects." When things start to go pretty well, you get joiners. The grapevine of parents who belong to a particular school or agency is the best grapevine in the whole world.

QUESTION—Do you find it of value to send somebody to observe the parents with the child to get operational data to work on? Sometimes the mother will overlook things she doesn't think are important—like the child playing with a plastic tube a lot. It could be used as a consequence.

GALLOWAY—We are going to be more careful about the kinds of things you're suggesting. I think for some parents, you are going to need to go in there and maybe take them by the hand and point out a child's behavior to them.

COMMENT—Our experience with parent classes indicates that parent run classes are most successful. From the first fathers' class I started, three fathers went on to start successful classes of their own. We're finding over and over again that our "students" are our best salesmen, but sometimes the best teacher is another teacher.

COMMENT—And speaking of teachers, there is no better way to bomb when you approach a school than to teach all the teachers at once in a curriculum coordinated setup. Some bright little student teacher will learn this new thing faster and shoot down the experienced teacher there. Just as you said about making sure the teachers are in a position to lead the parents, exactly the same thing happens with experienced teachers, principals, and supervisors. Make sure that your advisory teachers and curriculum supervisors learn these techniques first even though they may learn them more slowly. You just have to bring them up to criterion before you introduce the method to the people under them.

QUESTION—How early can you get to these parents in terms of the kids' age? What is the optimum time, in your opinion?

GALLOWAY—At one time we were able to offer classes to all parents in one moderately large center, and we tried to figure out which ones came and which ones didn't and who dropped out and who remained. We pulled all kinds of information out of the files, all the kinds of variables you could think of for describing the child, the family, everything. The results were kind of crude, but it looks suspiciously like the parents of the kids in the age range from about 9 to 14 were the most loyal. The parents of these children in the middle group were more loyal than even those of the younger ones, the 5 and 4 and 3 year olds. But our figures are sketchy.

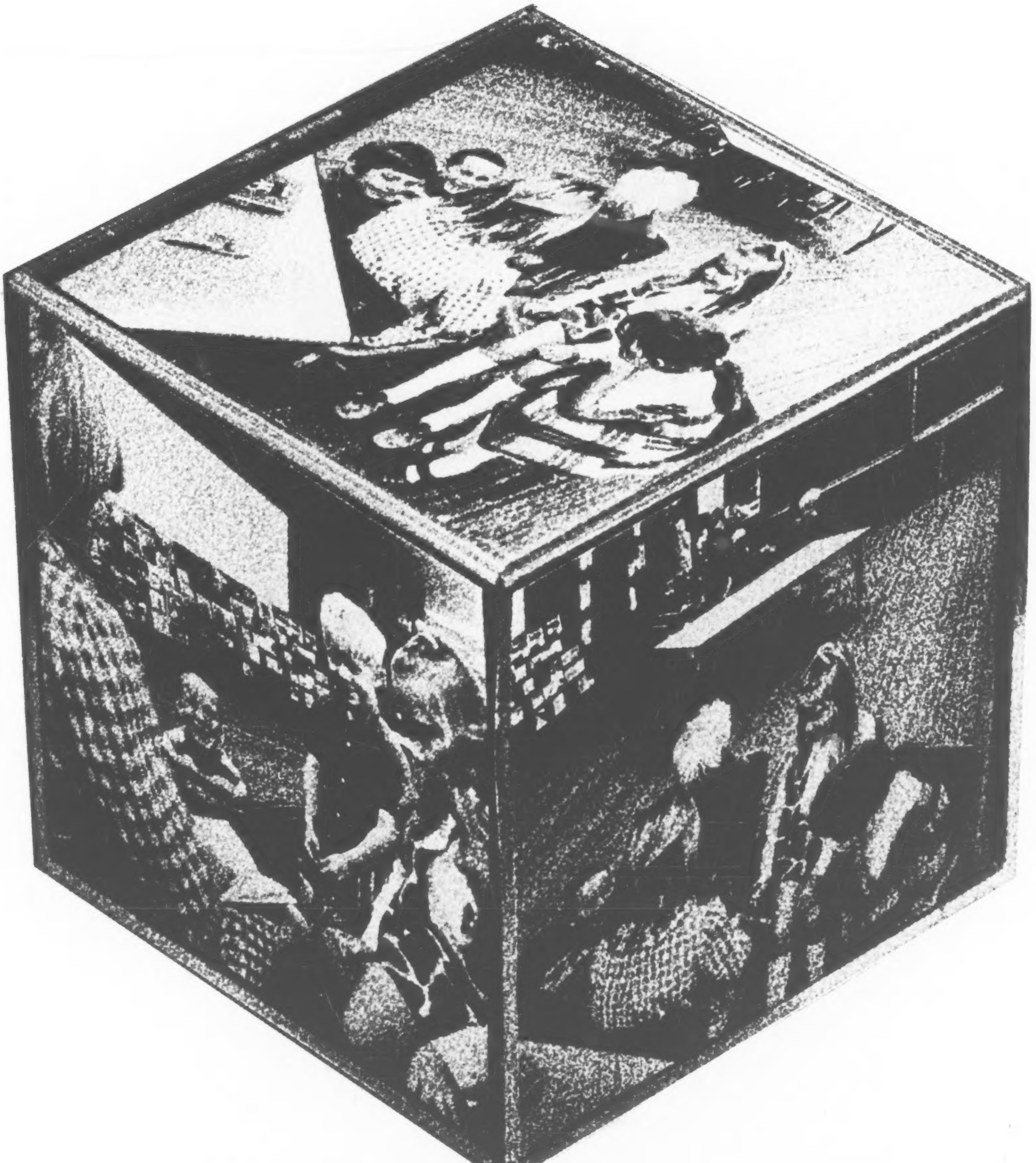
GALLOWAY—Look at it this way. You are asking a lot from these parents; it's a lot of work to do this careful observation and charting. Maybe the kids that are real little aren't such a problem yet. And parents of the older ones may have adjusted to them. The family becomes deviant, in a sense, by adjusting to that one human being. As someone said before, it's the same problem as dental care. Prevention is best, but the motivation to get in the chair is very low. Very low. I think when the kids become school age that maybe the differences become more apparent and that is when the parents look for help a little more. I don't know; it's a puzzling question.

COMMENT—There may be an interesting difference depending on when and if you can get these parents to look at a chart. If they can predict that in three years their child is not going to be making it, you may be able to make it with the parents. But they cannot project; there is no way for them to make a prediction into the future with their available information. If we can help them to make the projection, then they may come in.

GALLOWAY—There is a whole gold mine here of unanswered questions, and the only way we can answer them is to just get out and do the dirty work and then let the answers fall out. In our experience, parent participation didn't seem to have anything to do with the economic level of the families, or the educational level of the parents, or any of the other things we thought of. But that one little pinpoint...

COMMENT—It's how much a parent cares...

GALLOWAY—Yes, and I don't know how to measure that—except by their coming.



Teacher Training Tools for Precision

THOMAS E. CALDWELL

Thomas Caldwell is a teacher trainer with a large and widely scattered group of students. Many of his student teachers are in schools at an inconvenient distance from Illinois State University where he holds his classes. Reaching this audience with individualized instruction thus becomes an almost overwhelming problem. At the time of his presentation, Dr. Caldwell was in the process of developing a package of teacher training materials to solve this problem. Rather than describe these materials, he put the Invisible College participants through two lessons to demonstrate the kinds of procedures necessary for the long distance training of large numbers of people. He also indicated that precision charts of the trainees' behavior would help immeasurably in the trainer's ability to evaluate and aid his students.

DEVELOPING MAILABLE TRAINING METHODS

☐ Before showing you my teacher training materials let me describe my teaching situation at Illinois State University. In the special education department, there are 1,541 students, and over 300 in the area of behavior disorders. I help 110 curriculum advisees plan their programs and my seven student teachers and 26 practicum students are scattered out of commuting range. If you are talking about student-teacher ratio, it gets pretty wild. The question is: How thin can I spread myself and still do a quality job?

How thin can I spread myself and still do a quality job?

Direct contact with many of these students is obviously going to be limited, and so another method has to be found. One thing is certain: As a teacher trainer I need mailables. I've got such mass numbers of people to deal with and very little time to deal with them. There are student teachers whom I meet four times. What do I do when I've never seen them before or had them in any classes? I need some way to get hold of them.

Precision teaching techniques provide the teacher trainer a fast and accurate picture of what his student teachers are doing.

The way is precision teaching techniques. Precise identification of behaviors and the easy to read precision teaching charts can provide the teacher trainer a fast and accurate picture of what his student teachers are doing. If I mail this off to them, by the time I arrive they can have pinpointed and charted, and I can pick up some of the problems they've been having.

Thus far I've tried out these "mailable" packages only in my classes to get initial feedback on the materials themselves. The next step is to mail them off and collect data on the performance of the recipients. But now I have the chance for another bit of feedback from this Invisible College.

A TEACHER TRAINING LESSON

☐ Let me go over with you this lesson on the purposes and processes of teacher training itself. Students are requested to indicate their emphasis, or circle the group they would do first, on the first page of the package (Figure 1). Each of the categories listed on the first page is broken down on subsequent pages, and you would be asked to circle (or add) the picture symbol which applies to you. For "who" you teach, there is a choice of preservice and inservice trainees including aides, tutors, peers, and parents (Figure 2). When I think of teacher training, I think of teachers being more than people who stand up in classrooms in school buildings. They could be community service people, tutors, peers—anyone who is teaching someone else something.

Teachers are more than people who stand up in classrooms...A teacher is anyone who is teaching someone else something.

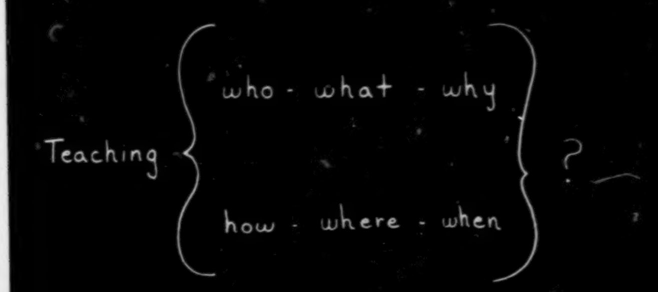
Symbols indicate a wide range of messages or content on the page labeled "what." Various teaching goals are symbolized under "why" (Figure 3). "Where" indicates the agency through which teaching takes place (public school, home, prison, college, etc.). The "how" page indicates transmitters like books, lectures, film, slides, tapes, and paper-and-pencil exercises. The time dimension is broken down into minutes-hours, days-months, and years categories.

The main thing, of course, is child progress...My message is precise behavioral management.

The main thing, of course, is child progress, and my message is precise behavioral management. And we are in some places like community programs, schools, colleges, universities, quite a few places. And the list is almost out of sight when it comes to media and transmitters. Lots of different variations. The last page (Figure 4) is a

Figure 1. Purposes and Processes of Teaching

A Planning Technique.


Teaching
who - what - why
how - where - when
?

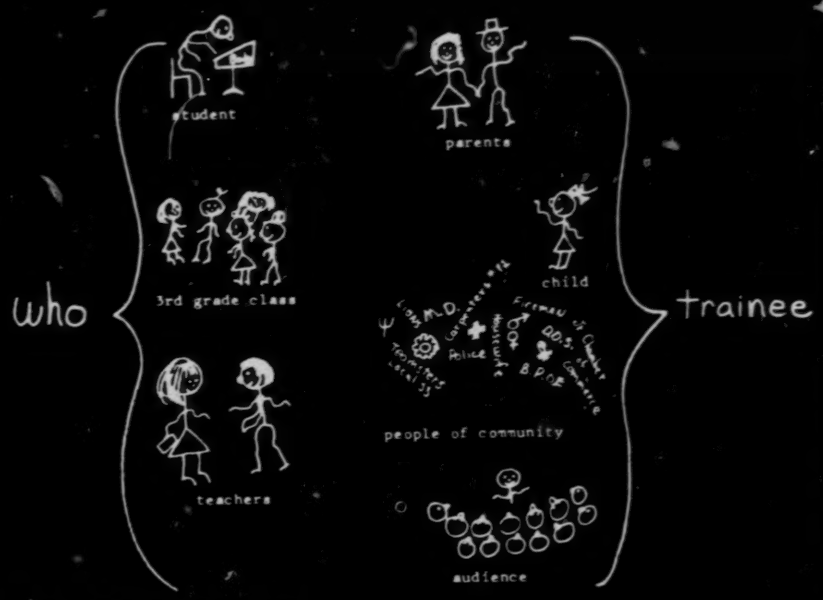

who
student
parents
3rd grade class
child
M.D.
Carpenters #72
Fireman
Chamber of Commerce
D.D.S.
Police
Housewife
B.P.O.E.
Teamsters Local 35
people of community
teachers
audience
trainee

Figure 2. Possible Trainees

Figure 3. Teaching Goals

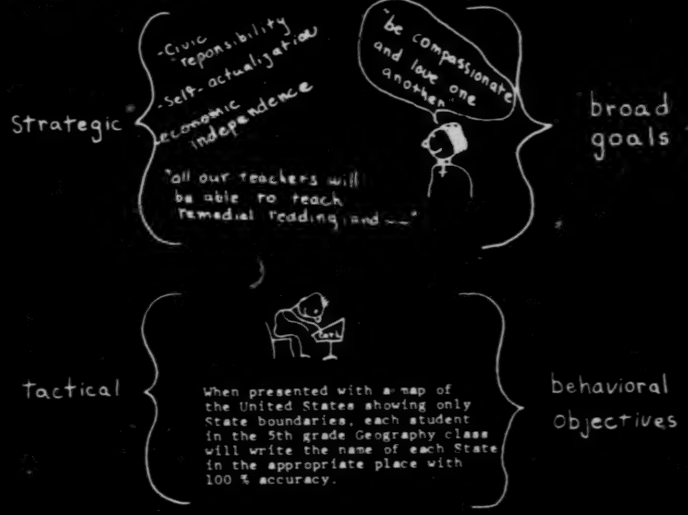
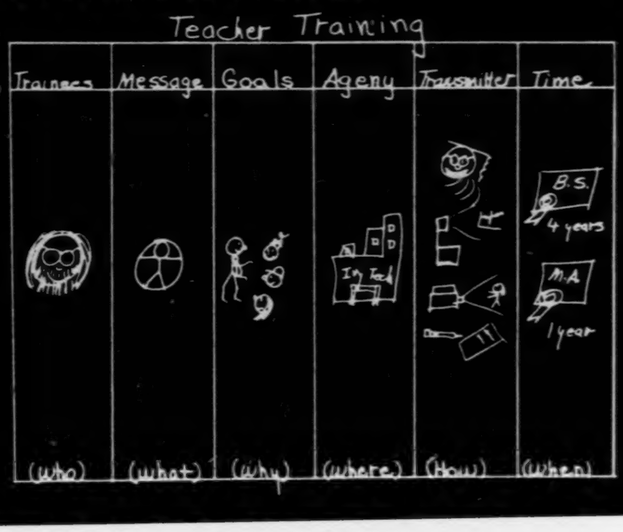

Strategic
-Civic reponsibility
-Self-actualization
-economic independence
"be compassionate and love one another"
"all our teachers will be able to teach remedial reading, and ___"
broad goals
why
tactical
When presented with a map of the United States showing only State boundaries, each student in the 5th grade Geography class will write the name of each State in the appropriate place with 100 % accuracy.
behavioral Objectives

Figure 4. Summary of the Teacher


Teacher Training
Trainees
Message
Goals
Ageny
Transmitter
Time
In Tech
B.S.
4 years
M.A.
1 year
(who)
(what)
(why)
(where)
(How)
(when)

summary of me and what I'm doing right now at Illinois State. working with preservice people, the message is precision teaching, and very broadly the goals are to help teachers work with children. The agency is the university, and the time commitment is with two types of degree program, one 4 year, one 1 year. I try to "transmit" in various ways. I talk a lot and use overheads, slides, and paper-and-pencil exercises.

There is more to learn from this demonstration than the possible methods and procedures of teacher training. This exercise has taken us eight minutes, but I was indicating when to turn pages and mark each choice. If this were charted, whose behavior would be on the chart? There's an awful lot of *me* in there, isn't there? It's not the student all alone. So this is controlled frequency, the teacher determining at what pace the student behaves. The group's charts would be almost identical.

Controlled frequency is the teacher determining at what pace the student behaves.

INNER AND OUTER BEHAVIOR: A MAILABLE LESSON

☐ Here's a different lesson which illustrates one of the transmitters introduced in the first. It is a paper-and-pencil attempt to transmit a message, containing a "before assay" or quick sample of where the trainee is before instruction, instruction, and an "after assay" which is supposed to indicate whether the segment taught anything or not. I use the term assay instead of pre- and posttest to indicate an emphasis on the material rather than on the student. The real thing is the interaction between the material and the person. Before, we emphasized testing the student and finding out what's wrong with him. But when Marshall Dillon takes material into Dodge City to the Assay Office, it's the material that's being tested. That's why I chose this terminology, to put the focus on evaluating the material.

Before, we emphasized testing the student and finding out what's wrong with him...

...here, it's the material that's being tested.

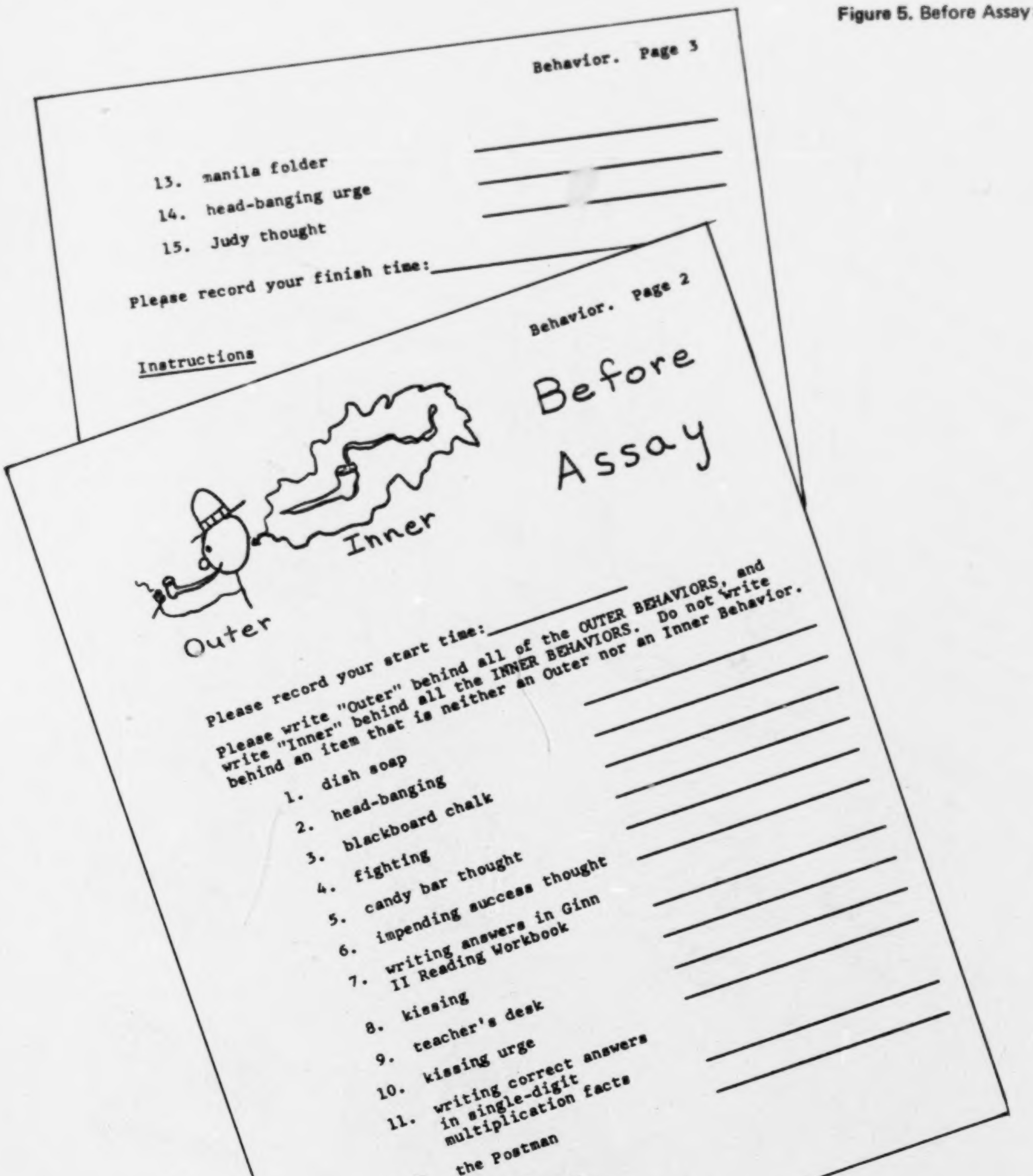
This lesson is on inner and outer behaviors, and you can have as much time as you need. You will find a before assay (Figure 5), instruction (Figures 6 and 7), a practice drill similar to the before assay and followed by a page with correct answers, and the after assay (Figure 8).

Now let me go over the after assay with you and talk about the different amounts of time different individuals took to complete the exercise. The students had the same number of problems, but the time it takes to supply the answers can vary. That makes it a freer exercise than the other one. Remember the first exercise we did together was paced by me, the teacher. A chart of each student's frequencies on this exercise is a clearer picture of *his* performance.

A chart of each student's frequencies on this exercise is a clearer picture of his own performance.

PRECISION CHARTS FOR LONG DISTANCE TRAINING

☐ What I really need as a teacher trainer is something to keep me from always having to be there for everything. At the same time, I need an accurate picture of what my trainees are doing. Precision teaching charts seem to be the answer. They provide built-in evaluation or assays of the material itself and help to point out particular problems the students might be having. And finally, the standardized form and concise, easy to read format of the charts makes them easily mailable and ideal for long distrance teacher training.



Behavior. Page 3

13. manila folder

14. head-banging urge

15. Judy thought

Please record your finish time:

Behavior. Page 2

Instructions

Before Assay
Inner
Outer

Please record your start time:

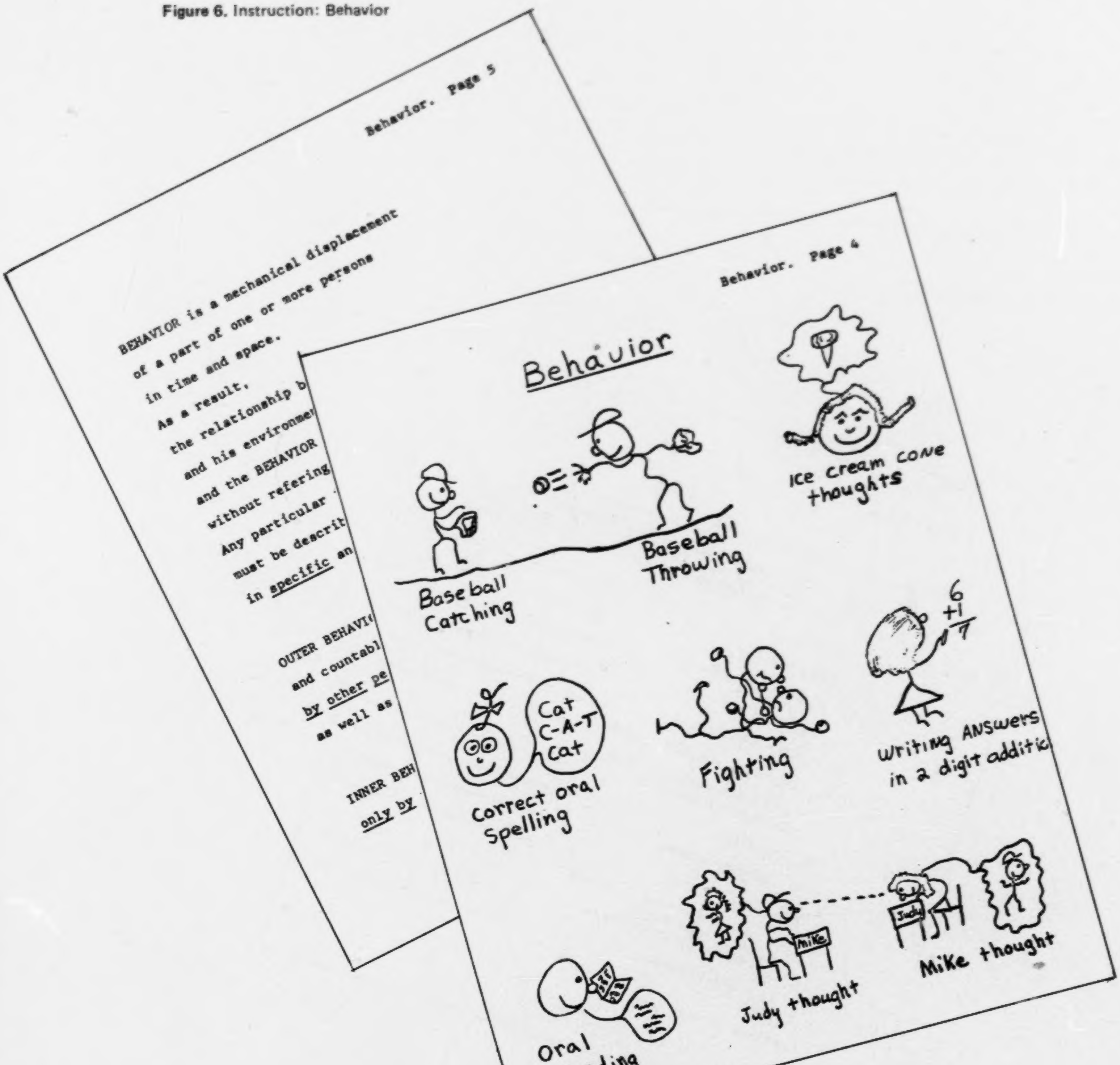
Please write "Outer" behind all of the OUTER BEHAVIORS, and write "Inner" behind all the INNER BEHAVIORS. Do not write behind an item that is neither an Outer nor an Inner Behavior.

1. dish soap
2. head-banging
3. blackboard chalk
4. fighting
5. candy bar thought
6. impending success thought
7. writing answers in Ginn II Reading Workbook
8. kissing
9. teacher's desk
10. kissing urge
11. writing correct answers in single-digit multiplication facts
12. the Postman

Continue on next page.

Figure 5. Before Assay: Inner and Outer Behavior

Figure 6. Instruction: Behavior



Behavior. Page 5

BEHAVIOR is a mechanical displacement
of a part of one or more persons
in time and space.
As a result,
the relationship b
and his environme
and the BEHAVIOR
without refering
Any particular
must be descrit
in specific an

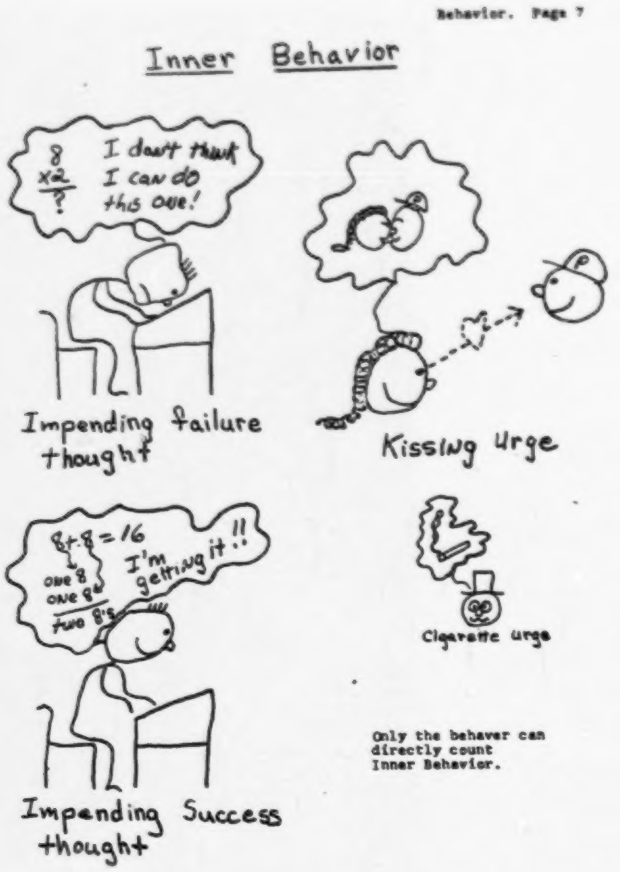
OUTER BEHAVI
and countabl
by other pe
as well as

INNER BEH
only by

Behavior. Page 4

Behavior
Ice cream cone thoughts
Baseball Catching
Baseball Throwing
6
+1
7
Cat
C-A-T
Cat
Correct oral Spelling
Fighting
Writing Answers in a digit additic
Mike
Judy
Judy thought
Mike thought
Oral reading

Figure 7. Instruction: Inner Behavior



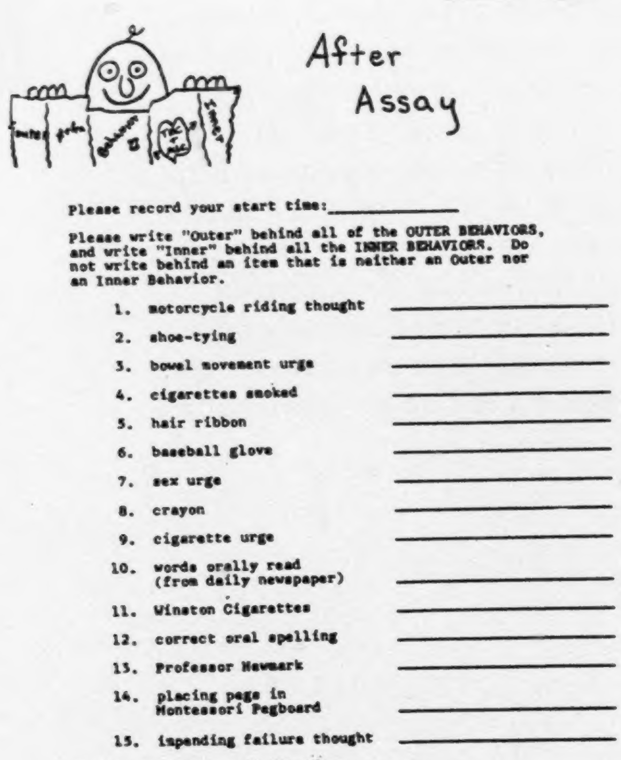
Behavior. Page 7

Inner Behavior

8
x2
?
I don't think
I can do
this one!
Impending failure thought
Kissing urge
8+8=16
one 8
one 8
two 8's
I'm getting it!!
Impending Success thought
Cigarette urge

Only the behaver can directly count Inner Behavior.

Figure 8. After Assay: Inner and Outer Behavior



Behavior. Page 10

After Assay

Please record your start time:______________

Please write "Outer" behind all of the OUTER BEHAVIORS, and write "Inner" behind all the INNER BEHAVIORS. Do not write behind an item that is neither an Outer nor an Inner Behavior.

1. motorcycle riding thought ______________________
2. shoe-tying ______________________
3. bowel movement urge ______________________
4. cigarettes smoked ______________________
5. hair ribbon ______________________
6. baseball glove ______________________
7. sex urge ______________________
8. crayon ______________________
9. cigarette urge ______________________
10. words orally read (from daily newspaper) ______________________
11. Winston Cigarettes ______________________
12. correct oral spelling ______________________
13. Professor Newmark ______________________
14. placing pegs in Montessori Pegboard ______________________
15. impending failure thought ______________________

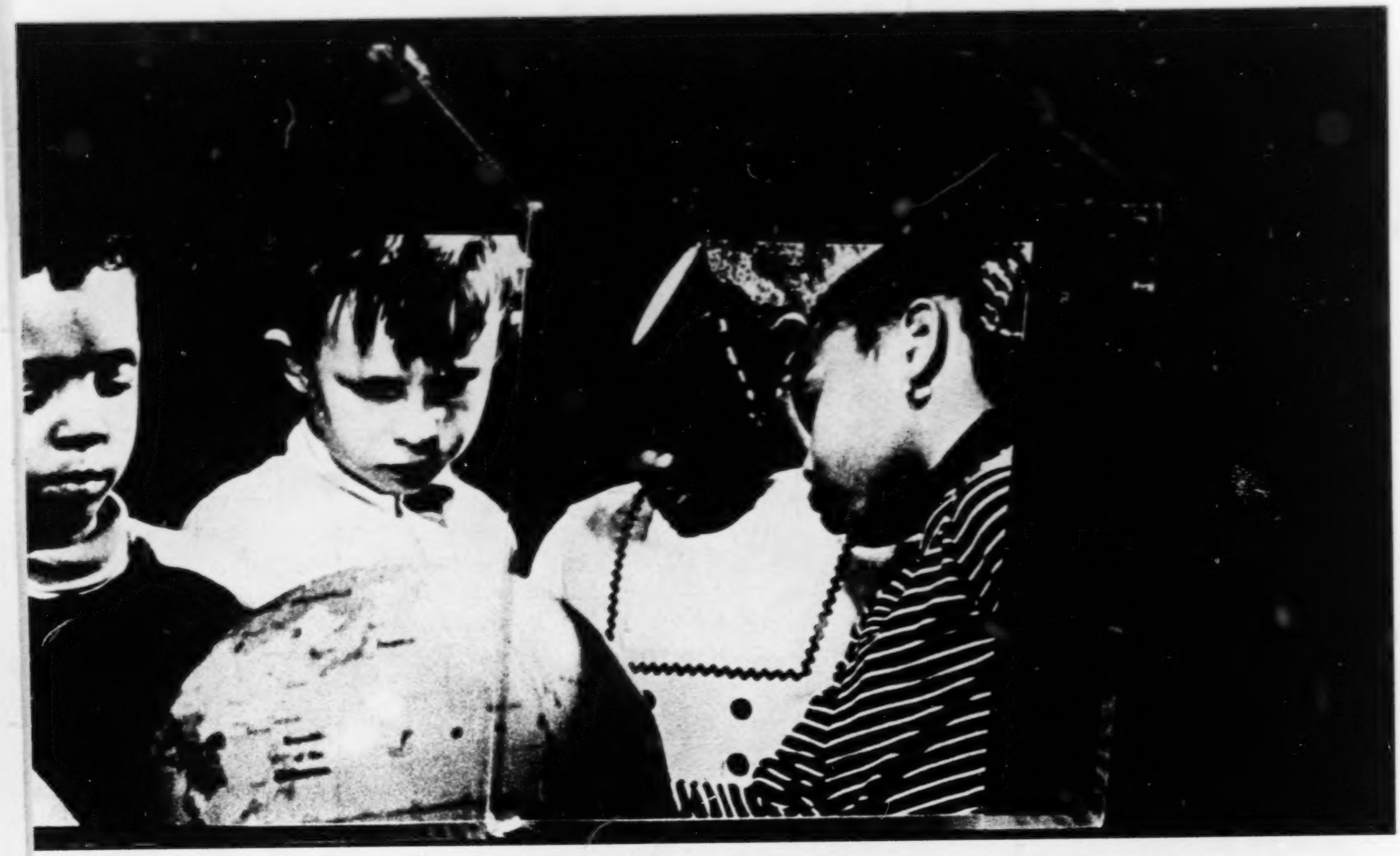
Please record your finish time:______________

Please turn to next page and compare your responses.

For Successful Program Maintenance: Look at the Data First

HAROLD KUNZELMANN

Behavior modification techniques, particularly the use of precision teaching charts, serve another valuable purpose besides that of changing the behavior of children in the classroom. They can be used to change the behavior of school systems. Harold Kunzelmann, a "program maintainer" for statewide programs in Washington State, charts the behaviors of both teachers and students to determine who is using behavior modification techniques and with what success and to justify this use to both the staff themselves and those who fund the programs. This procedure gives the opportunity for two types of positive reinforcement for the teachers involved in using precision teaching. First, the program maintainer, or the administrators or parents, can see the successes of the teacher clearly and easily and communicate praise to him. Secondly, and this is in a sense a survival factor, the funding agents of the programs can provide that very positive reinforcer, more money to maintain—or increase—the program. Mr. Kunzelmann addressed himself to two aspects of help for exceptional children: increasing the numbers of children served and improving the quality of that service. He stressed the importance of "knowing what's going on" both at the level of the individual child and in the statewide program. He is concerned not only with the children and teachers, then, but also with support personnel and administrators, and with what all concerned can do to improve the disposition of the handicapped child.



PROGRAM MAINTENANCE

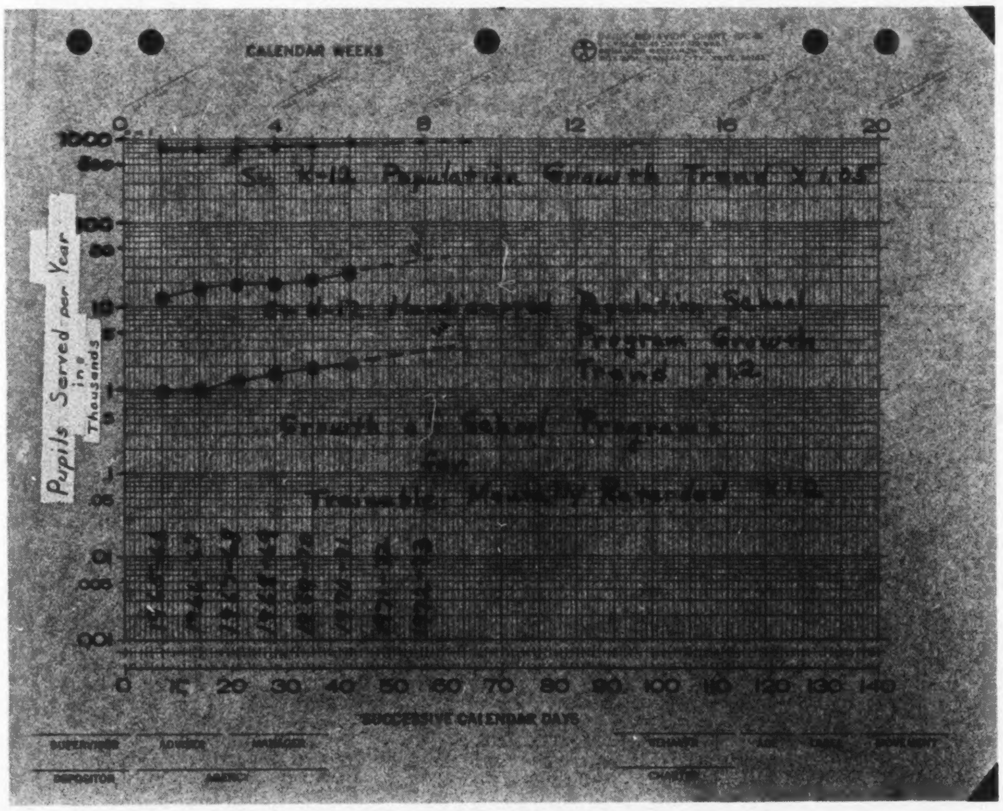
Our basic goal is to get more and more service to kids...we can and should be charting our progress.

☐ I appreciate being asked to talk about program maintenance not only because of its importance but also because we have some very basic data to share with you. We know that in 1969, according to the surveys of the Office of Education, there were 38 to 40 percent of handicapped children in this country receiving service. So our basic goal, no matter what happens in the next twenty years, is to get 100 percent by 1990 when most of us can still play catch with these kids and still be active in the field of helping disabled children. We've got to get more and more service to kids. That is our goal, and I think we can and should be charting our progress.

PROGRAMS FOR HANDICAPPED IN WASHINGTON STATE

☐ Let me give you some data from the state of Washington (Figure 1). The total handicapped program in the state is increasing in funds at about 20 percent a year since 1965. Keep in mind that Washington is a top state in the nation in terms of ratio of giving service to handicapped children. The national average is around 40 percent; we're running in the neighborhood of 68 percent of covering our handicapped children's needs. My particular job, as Supervisor of Mental Retardation Programs, allows for having teachers learn and use precision teaching techniques with the trainable and educable mentally retarded in the state. The growth of this trainable program is the same as that of the general handicapped program. We anticipate another 900 children who will have to be given service. We

Figure 1. Programs for Handicapped in Washington State



need more money, more programs, and most of all, we have to be accountable for the way that money is spent. Will we, in 1990 in our particular setting, have 100 percent coverage? That's the issue we are faced with.

If we look at our data more carefully, we see a little more growth in the work with the educable mentally handicapped children, but it is still close to the general program. About 49 percent of the children identified as needing service programs are called EMR. That means that they have some learning problems but will probably function in the real world from day to day. So our job in modifying their behavior and in applying behavioral principles is probably going to be extremely critical. We are not dealing only with the "head-bangers" but with children who say their numbers and their sounds kind of slowly, who are a grade or two behind. Thus, somewhere among the techniques for maintaining programs, we have to insure that we've identified these children accurately and that we know what our goals are.

These children will operate in the real world from day to day.

We need to have a functional system for disseminating information about techniques of precision teaching to lots of teachers. Programing becomes a critical issue; it tells the program maintainer "where we are going" at every level from the federal government worrying about 40 percent coverage to the individual teacher's concern about a particular child who does not reach his educational objective. These things need to be specified, and they can and need to be charted.

Charting tells us where we're going.

During the last year, I worked with charted data from the state of Washington. We anticipated that the state legislature would ask us how the dollars they gave us help in terms of getting these kids into society with some skills. The question was how could we make a quick assessment? So we asked for charts from the school districts to determine what kinds of projects were operating in the classroom and what kind of counting was going on.

CHARTING PROGRAM MAINTENANCE

☐ As a program maintainer, then, I asked to see acceleration charts from teachers to indicate improvement in student progress (Figure 2). We also looked at the number of changes of instructional tactics indicated on the charts. For example, in 70 of 786 acceleration charts, there was no change in instruction indicated. This does not mean the teacher was not doing anything. Instead, it indicates that she was getting success with her original methods and did not have to instigate various kinds of phase changes or instructional options.

Secondly, I was concerned about time. How much classroom time does it take to do the operations we want? We found most of the samples evenly divided between one minute samples of performance and one to ten minute samples. This tells us something important about the kinds of programs that make changes; short samples work. It indicates also, in terms of curriculum development, that we need

Charting short time samples works.

Figure 2.

Dec. 1970

Superintendent of Public Instruction - Department of Special Education

1. Total number of charts submitted 786 by 16 school districts.
2. Type of child performances - Movement Cycles:

List of acceleration targets	Total 712	List of deceleration targets	Total 74
Math	59	Tardy	17
Reading	363	Thumb Sucking	4
Writing	215	Negative Words	12
Art	51	Make Disturbances (throw-hit, etc.)	41
Other	24		

3. Number and type of instructional changes:

Total number 716

Programmed Event Changes	567	Arranged Event Changes	149
Math	8	Praise	105
English	186	Intervention	6
Writing	180	Review	21
Art	94	Counting	16
Other	99	Thumb Sucking	1

4. Observation time - Summary:

a. from 0 to 1 342

b. from 1 to 10 411

c. from 10 to 100 33

5. Acceleration analysis:

a. number of charts going up 607 where desired rate was up

b. number of charts staying the same 50 where desired rate was up

c. number of charts going down 69 where desired rate was up

d. number of charts going down 44 where desired rate was down

e. number of charts staying the same 7 where desired rate was down

f. number of charts going up 9 where desired rate was down

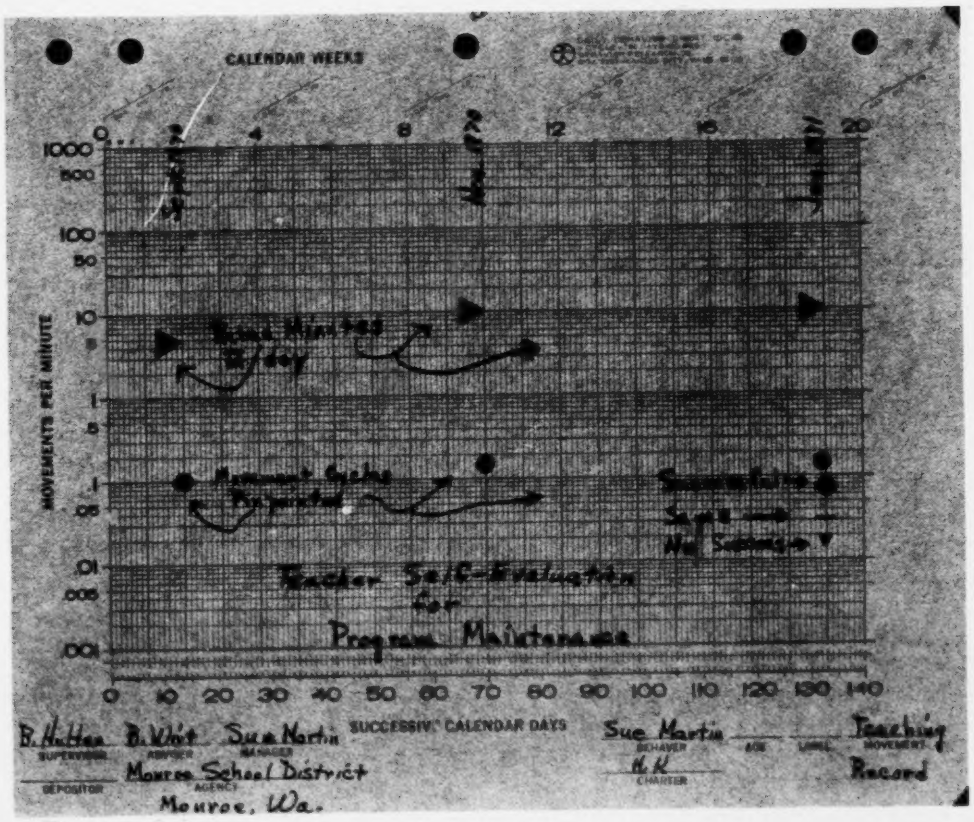


Figure 3. Teacher Self-Charting

to develop some very rapid things. I found out, to my surprise, that the complaints that programed instruction keeps kids sitting with charts for 30 minutes at a time simply weren't true.

Thus, the first thing necessary for a program maintainer is to know the facts, to know *precisely* what the teacher is doing in the classroom. Any local classroom or program, I think, is a kind of assay of the total picture of what's going on. As a program maintainer, I must be able to communicate to the classroom teacher, the school district, the director of special education, or the superintendent of schools, "I would like to see that continued and here is why." In terms of teachers doing precision teaching behavior analyses, 607 of them (or about 6 to 1) are doing very, very nice work and are totally accountable for the kids they set goals for in education. This program needs to be maintained.

The program maintainer must know precisely what goes on in the classroom.

I'd like to give you a quick sample of what one particular teacher did with self-charting (Figure 3). Mrs. Sue Martin is a teacher in the Monroe Public School District. She assessed rated minutes in the classroom because programed minutes (the amount of time a child is in the room) is certainly different from the number of minutes you can look and record or have him record. Her data show that through the year she increased rated minutes but reduced the number of pinpoints. Her students reached 79 of 124 of the targets she set for

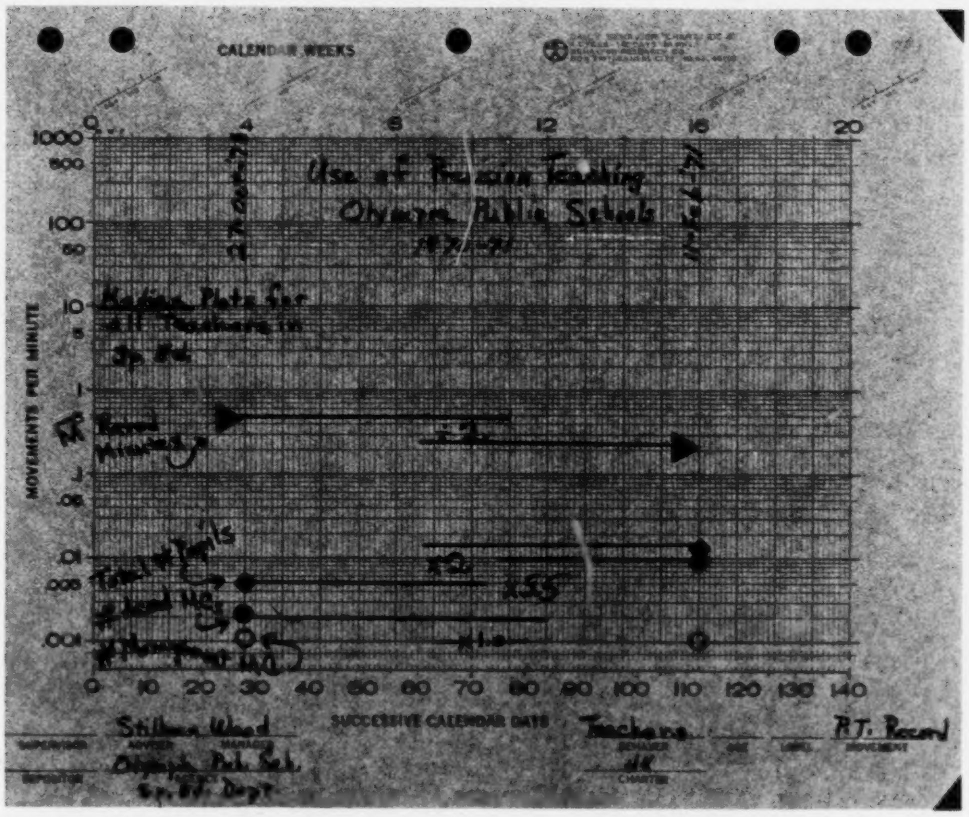


Figure 4. Precision Teaching in a School District

The teacher picked some material that blocked kids' performance, but at least she was able to know that from the charts.

them. She had 33 who did not accelerate. She noted that she had picked some material that blocked kids' performance, but at least she was able to know that from her children's charts. Because of this charted success, she can say to her boss, and to the parents, and to the *kids*, "Hey, kids, we are doing great, 79 of our charts hit our targets!" I think that is important.

Here is another example of data from a district (Figure 4). Stillman Wood in Olympia Public Schools submitted this material concerning his total group of 33 teachers. They started with a workshop on precision teaching. In their classrooms, they came up with a median of 500 rated minutes each in October. They also indicated number of pupils and number of movement cycles. By February, their rated minutes had divided by two yet the number of pupils had doubled. Also interesting is the movement cycles in the academic area came up times 5.5. However, the number of teachers reporting was 49 percent less. This is Stillman's analysis:

Charting provides a way of assessing and improving program maintenance.

"The maintenance of precision teaching dropped off in numbers of teachers reporting, although medians appear to be maintained. My assumptions for those not reporting are nonutilization. I trust this type of data is of use to you. To a program administrator, it is meaningful in terms of strategies for maintaining precision teaching. Contacts from this office need to be increased." Stillman Wood wants to evaluate his program, and he's discovered some dimensions for checking it. He thus knows if what he's doing to improve maintenance is working.

The useful tactics that emerge from these two examples are charting (a) rated minutes, (b) number of pupils, (c) movement cycles that are academic and those that are management, (d) rate of acceleration, and (e) accomplishment of target goals. Another variable is getting the children involved or the rate at which the teacher or the child collects the performance rates. Recording data can become an overload for the teacher, and the children can provide much more charting in the same amount of time. These are methods for finding out for sure whether these kids are getting where we want them to go.

COMMUNICATION AT EVERY LEVEL OF PROGRAM

☐ One of the primary jobs of the program maintainer is communication. You have to know what to communicate about, of course, and that's your data. And you communicate on every level of the system, to the teacher with praise, to others with suggestions, to administrators and funders for support. Also, in program maintenance, there has to be an "alert system," which indicates that something is going wrong as well as right. Rate ranges of performance of all the students is one technique to provide an alert. It is expensive in terms of time, but many children can help to do this without monetary expense.

Needed: an "alert" system.

One way to decrease the time expense involved in the schools is to make the precise data gathered by one teacher available to the next. To decrease the load of paper work—or time expense—for the classroom teacher is one of the jobs of support personnel. These are individuals already in the schools, people like the school psychologist, counselor, social worker or therapist. I think the support person in the system at this time is the one who must be able to gather tactics that work for Johnny and pass them on to the next teacher. He should be trained to look at the data, the charts on Johnny, to read them, and to communicate their information in a useful way. He should take the responsibility of telling the fourth grade teacher, for example, that certain things have been tried by Johnny's third grade teacher and haven't worked. It is the job of the principal to look at the whole group of fourth graders, but the job of the support person is to track the individual child from place to place. I cannot find a school district at this time that has a complete system for transmitting this very useful information in a viable way so that the teacher who has 10 or 30 students can know, on the first day of school, the best way to program for Johnny.

Support personnel should track the individual child from place to place.

The job of the support personnel is to support the child and the teacher is the transmitter. The support person has to be able to communicate from the already existing data, from what has already happened. I doubt very much if he is going to be the director of what

The job of the support personnel is to support the child...

the child is going to do tomorrow. The teacher is the first person who sees the child; the support person is the last. He only sees the student when the charts indicate that he has to. This does not mean that the support person cannot set targets. He can indicate proficiency levels of performance or acceleration lines as goals and he can communicate the successes of others in the system.

...to be an information pipeline...

Thus support personnel are essentially communicators. For example, there needs to be an information pipeline from the classroom teacher, from the desk where Billy is doing numbers at two a minute, to teachers in training. That pipeline might be the support personnel. And I think that the support person is the one who is going to have to sell measurement, sell the techniques. He praises the teacher. He is the reinforcer and can be the key to program maintenance.

...to sell the technique.

PROGRAM MAINTENANCE MEANS KNOWING WHAT'S GOING ON

☐ In summary, I think that program maintenance means knowing what is going on with individual pupils. We need to look at this because of the vast number of times children are looked at in massive groups. Having this data allows us to make decisions at any level. And at each of these levels there is going to have to be analysis of charted data, all the way from the federal level down to the individual child who is turned on looking at his own progress. The essence of program maintenance is to *look at the data first.* Because, for the first time in the history of man, we have an instrument (the 6 cycle X and ÷ chart) that will allow us to immediately assess change of any known behavior. In terms of classroom operation, we have the tools with us now that will allow any classroom teacher in the world to look into the gold field and sieve out and find something useful to him about how kids learn. Successful program maintenance means that this tool will not be wasted.

Selected Readings

Bates, S., & Bates, D. F. "...and a child shall lead them": Stephanie's chart story. *TEACHING Exceptional Children*, 1971, **3**(3), 111-113.

Bijou, S. W. The mentally retarded child.*Psychology Today*, 1968, **2**, 47-51.

Bijou, S. W., Birnbrauer, J. S., Kidder, J. D., & Tague, C. Programmed instruction as an approach to the teaching of reading, writing, and arithmetic to retarded children. *Psychological Record*, 1966, **16**, 505-522.

Bijou, S. W., & Grimm, J. A. The education and training of the retarded child. In W. C. Becker (Ed.), *Uses of reinforcement principles in education.* Champaign, Ill.: Research Press, in press.

Cohen, M. A., & Martin, G. L. Applying precision teaching to academic assessment. *TEACHING Exceptional Children*, 1971, **3**(3), 147-150.

Council for Exceptional Children. *Behavior modification: Exceptional child bibliography series.* Arlington, Va.: Council for Exceptional Children, 1971.

Duncan, A. D. Self-application of behavior modification techniques by teenagers. *Adolescence*, 1969, **16**(4), 541-556.

Duncan, A. D. The view from the inner eye: Personal management of inner and outer behaviors. *TEACHING Exceptional Children*, 1971, **3**(3), 152-156.

Exceptional Children, 1970, **37**(2).

Gaasholt, J. Precision techniques in the management of teacher and child behaviors. *Exceptional Children*, 1970, **37**(2), 129-135.

Gallagher, J.J. Classroom behavior modification techniques applied to educationally deprived primary age children. Special Study Report I. Durham Education Improvement Program, North Carolina, 1967.

Galloway, C., & Galloway, K. C. Parent classes in precise behavior management. *TEACHING Exceptional Children*, 1971, **3**(3), 120-128.

Galloway, C., & Galloway, K. C. Parent groups with a focus on precise behavior management. *IMRID Papers and Reports*, 1970, **7**(1).

Gardner, W. I. *Behavior modification in mental retardation.* Chicago, Ill.: Aldene-Atherton, 1971.

Haughton, E. Great gains from small starts. *TEACHING Exceptional Children*, 1971, **3**(3), 141-146.

Hulten, W. J., & Kunzelmann, H. P. Teacher attention: A social consequence. *Mental Retardation*, 1969, **7**(4), 11-14.

Johnson, E. C. Precision teaching helps children learn. *TEACHING Exceptional Children*, 1971, **3**(3), 106-110.

Kunzelmann, H. P., Cohen, M. A., Hulten, W. J., Martin, G. L., & Mingo, A. R. *Precision teaching: An initial training sequence.* Seattle: Special Child Publications, 1970.

Lindsley, O. R., The beautiful future of school psychology: Advising teachers. In M.C. Reynolds (Ed.), *Proceedings of the conference on psychology and the process of schooling in the next decade.* Minneapolis, Minn.: University of Minnesota Audio-Visual Extension, 1971, Pp. 116-120.

Lindsley, O. R. Direct measurement and prosthesis of retarded behavior. *Curriculum Bulletin,* 1969, **25**(303), 1-31.

Lindsley, O. R. An experiment with parents handling behavior at home. *Johnstone Bulletin,* 1966, **9**, 27-36.

Lindsley, O. R. How to count. In C. China, A. S. Gross, J. Milby, & L. Peterson (Eds.), *Proceedings of third annual behavior modification institute.* Tuscaloosa, Alabama, 1970, Pp. 8-38.

Lindsley, O.R. Precise behavioral management system. In M.C. Reynolds (Ed.), *Proceedings of the conference on psychology and the process of schooling in the next decade.* Minneapolis, Minn.: University of Minnesota Audio-Visual Extension, 1971, Pp. 121-130.

Lindsley, O. R. Procedures in common described by a common language. In C. Neuringer & J. L. Michael (Eds.), *Behavior modification in clinical psychology.* New York: Appleton-Century-Crofts, 1970, Pp. 221-236.

Lindsley, O. R. Protege to behaver. *Behaviorgrams,* 1970, **1**, 39.

Lindsley, O. R. A reliable wrist counter for recording behavior rates. *Journal of Applied Behavior Analysis,* 1968, **1**, 77-78.

Lindsley, O. R. Theoretical basis for behavior modification. In C. E. Pitts (Ed.), *Operant conditioning in the classroom.* New York: T. Y. Crowell, 1971. Pp. 54-60.

Lindsley, O. R. Training parents and teachers to precisely manage children's behavior. In *Special education colloquium.* Flint, Mich.: C. S. Mott Foundation, 1968, Pp. 42-53.

Lovitt, T., Kunzelmann, H. P., Nolen, P. A., & Hulten, W. J. The dimensions of classroom data. *Journal of Learning Disabilities,* 1968, **1**(12), 710-721.

MacKay, H. A., & Sidman, M. Instructing the mentally retarded in an institutional environment. In G. A. Jervis (Ed.), *Expanding concepts in mental retardation.* Springfield, Ill.: Charles C Thomas, 1968.

Madsen, C. H., Jr. You are already using behavior modification. *Instructor,* 1971, **81**(2), 47-56.

Morrey, J. G. Parent training in precise behavior management with mentally retarded children. Unpublished doctoral dissertation, Utah State University, 1970.

Patterson, G. R., & Anderson, D. Peers as reinforcing agents. *Child Development*, 1964, **35**, 951-960.

Patterson, G. R., & Fagot, B. Selective responsiveness to social reinforcers and deviant behavior in children. *Psychological Record*, 1967, **17**, 369-378.

Precision teaching in perspective: An interview with Ogden R. Lindsley. *TEACHING Exceptional Children*, 1971, **3**(3), 114-119.

Skinner, B. F. *Science and human behavior.* New York: Appleton-Century-Crofts, 1953.

Skinner, B. F. *The technology of teaching.* New York: Appleton-Century-Crofts, 1968.

Starlin, C. Evaluating progress towards reading proficiency. In B. Bateman (Ed.) *Learning Disorders, Vol. II.* Seattle: Special Child Publications, 1971.

Starlin, C. The need for a standard and more precise means of educational measurement. In J. Morrey (Ed.) *Learning and behavior management in teacher training.* Pochatello, Idaho: Idaho State University, 1971.

Starlin, C. Peers and precision. *TEACHING Exceptional Children*, 1971, **3**(3), 129-140.

TEACHING Exceptional Children, 1971, **3**(3).

Zimmerman, J. Doing your own thing with precision: The essence of behavior management in the classroom. *Educational Technology*, 1971, **7**(4), 26-32.

Additional Resources

A color filmstrip with sound cassette, *Let's try doing something else kind of thing - PRECISION TEACHING* is available for $20.00 from The Council for Exceptional Children, Publication Sales, 1411 South Jefferson Davis Highway, Suite 900, Arlington, Virginia 22202.

The Standard Daily Behavior Charts as well as Behavior Counters and Behavior Timers can be purchased from Behavior Research Company, Box 3351, Kansas City, Kansas 66103.